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A Message from Pan

By E. CHESLEY ALLEN

Out at the curb in front of my office window a primitive vehicle drawn by a single red-and-white ox yoked between the shafts comes slowly to a halt. After a brief conversation between the occupants of the rough board seat—a stout negress and her lank, loose-limbed son—the woman climbs wearily over the near front wheel and presently appears at my door with her basket of "evergreens" and tightly-tied bunches of mayflowers. I select a bunch of pink-and-white treasures and, in pity for their cramped bondage, spread them loosely in a bowl.

As I bury my face deep amid their myriad of alabaster vases I experience the potency of incense in its effect upon the depths of the subconscious mind. Here is incense from the shrine of the sylvan deities; and, as my lungs fill with this most exquisite of all woodland odors, desk, papers, books and all my office cares slowly fade, and I am in the open, following down the brook, along the margin of the lake, up the woodland slopes, and out upon the granite-ribbed, wind-blown hills where life, free, abundant life, is surging forward at the call of spring.

It is mid-April.

The robins, juncos and song sparrows have been back for two weeks and are busy house-hunting in the bushy tangles and cavities of steep banks. A male junco, that, a moment ago, had been gurgling sweet nothings and strutting with spread wings and tail before his more practical and sedate lady-love, flies to the top of a dead tree and demonstrates his two quite distinct songs, a rapid, pebbly trill and a much more deliberate repetition of a mellow note that to me is too slow to be called a trill, but which sets me wondering when a trill ceases to be a trill.

Mourning-cloak butterflies have come out of their winter retreats and, alighting in warm sunny spots, are lazily opening and closing their velvety wings. Across the open clearings and flying at tree-top height are those dainty Geometrid moths known to the entomologists as *Brephos infans*. In their swift zigzag flight and reddish appearance they remind me of the rusty tussocks of early autumn, but on the rare occasions when one has alighted he has shown me fore-wings distinctly marked with dark gray and pure white, and rear wings black and bright rufous. As to the earlier history of these beautiful sprites or how they spend the winter I am quite ignorant, and deservedly humble, for they are as typical of our warm April days in the North as the mayflower itself, but almost entirely unknown.

From the top of a distant rampike a flicker announces his presence by a ringing "ke-you". Instantly my mind goes from flicker to ants. I lift a flat stone and, sure enough, they are up from their deep winter chambers and are making ready the galleries beneath the stone for the incubation of their larvae and pupae. None of these helpless forms are to be seen yet, but here in one of the galleries are several of those strange, limpet-like larvae of the *Microdon* flies. I pick one up and place it, flat side down, upon my note-book. In color and shape it looks not unlike a miniature half potato. Ever so slowly it moves across the page. I recall that I have never found these larvae except in ants' colonies; and here, again, I own my ignorance of the strange relationship between the busy inhabitants of the ant city and these slow-moving, Trappist-like intruders.

Up on the hillside I disturb a chipmunk digging in the soft leaf-mould. He has not been many days out of his winter retreat under ground. He greets me with his sharp diminutive bark and disappears into a rockpile. What had he been so intently digging for? I start rooting upon his claim and soon find a number of acorns of the red oak, plump with rich food for any seed-loving animal, and already sending forth the first tender sprouts that, perhaps once in a thousand times, may develop into an oak sapling, and perhaps one time in a hundred thousand grow to maturity. But enemies are legion from the time the flower-bud forms on the parent tree until the seedling has become a sturdy sapling. Several of the acorns I unearth are soft and pulpy; and when I open them I find, instead of the rich food for a seedling oak, a cluster of small, hard bodies like wild cherry stones. Each of these contains a fat insect grub. At some time in the development of the acorn an insect has punctured its shell and laid its eggs therein, thus serving her own purposes for the next generation at the cost of those of the oak. Such, indeed, is Nature's plan.

Through the oaks and up the hill into the open I wander, searching for those delicate pink-and-white faces that are so emblematic of the resurgent spring. A great black-and-yellow-banded bumblebee booms past and hovers over a mat of last year's fallen leaves. Perhaps she knows the way. I follow her lead and come upon her where she has found them, cluster after cluster, in rich but dainty beauty. She is mumbling over one flower and then another, thrusting her long tongue down into their dainty vases for the tiny drops of aromatic nectar that she loves. Perhaps her visits will serve to carry pollen from one flower to another and to "set" the seed for a new generation. Perhaps, but not likely; for, in our climate at least, apparently only one flower in thousands matures its seeds, the plants depending upon their prostrate running stems for propagation. Here, sheltered by a rocky ledge, the flower buds formed last autumn; and here, all winter, they have lain under the snows, hushed by the whispered lullaby of dry, clinging beech leaves above until the chorus of tinkling April rills and gurgling chickadees aroused them.

THE BUMBLEBEE LEADS THE WAY TO MAYFLOWERS

Reluctantly I turn away, for already the little flecks of cloud in the western sky are taking on a suffusion of rose, and from the top of a tall fir spire comes the pure silver call of the first white-throated sparrow.

Swiftly, in checkered gray and gold, the April days glide past and early May arrives. Again I am by the lake, up the brook, and along the wooded ridges.

The red maples are in full flower, and side by side can be seen the bright, almost orange-red of the staminate or male tree and the deep crimson of its mate bearing all pistillate, or seed flowers. In a few days the male flowers will fall, their duty done, but the pistillate flowers will develop into beautiful pairs of pendant winged seeds.

The pussy willows have passed their soft-gray, furry stage and are holding high reception to their myriad of insect guests, serving sweet nectar and hearty golden pollen. Little blue butterflies daintily uncoil their spiral tongues and thrust them into the nectar sacs. Bee-flies, dressed in soft brown plush, hover on invisible, whirring wings, and thrust their long beaks into the liquid treasure. How like they are to miniature hummingbirds or the hawk-moths that will later visit our garden honeysuckles! Bumblebees, black-and-yellow or black-and-orange, blunder from flower to flower, and deliberately cover their furry coats with yellow pollen. Bristly Tachinid flies and little polished brown beetles are there, all bent upon securing as much as possible of the repast in the few short days that it will be served. Scores of little black ants, although not winged, have, in the mysterious way that ants learn such things, heard of the feast. Not blessed with beaks, they are ludicrous in their efforts to get at the concealed nectar, fairly standing upon their heads in the mouths of the florets, their hind legs waving impotently in the air, but stopping occasionally and coming to a more sane position for the purpose of cleaning their precious antennae with their front legs.

Down at the lake shore that beautiful heath, cassandra, is in full flower, its dainty, tapering procession of little, inverted, cream-colored urns hanging from the axils of its bronzed, persistent leaves. Perhaps because of its love for the more inaccessible bogs and wet lake margins this shrub is almost unknown, certainly by name, but its delicate grace earns for it a real place in decorative art.

Far up the lake, on a little gravelly beach, are two black-and-white objects that I take to be a pair of black-backed gulls that have come to nest in this inland lake. But my glasses correct the error, and show me two magnificent American merganser drakes, their snowy breasts and wing patches gleaming in the sun and their velvety heads iridescent with green reflections. Between them is the object of their attentions, a sober-colored, brown-headed female. Presently the three take quietly to the water and swim along the shore in my direction. I crouch low and freeze into immobility. On they come, one of the males, who seems to have control of this triangular situation, in the lead. Thirty yards, twenty, ten yards; and I can see their bright red bills and feet and the carmine iris of each watchful eye. Straight in front of me, ten feet away, is a little break in my cassandra screen. Will I stand the test of being a gray and brown boulder while they pass it? The leading drake comes abreast and views me with unconcern. Now the lady comes into view and the line between her bright eye and my crouching figure is no sooner clear than, with a hoarse, indignant cry that speaks volumes for the inefficient stupidity of her lord, she leads the way straight out over the water, and in a few seconds three pairs of large white wing-patches are beating in perfect unison around the next wooded point.

In the clearing the mayflowers have passed their prime, but in the deeper shade where the snow has lain longest I may still find them at their best. Presently, amid the hemlocks, I come upon them, larger, paler, and with leaves less browned by the sun than their sisters of the open. I stretch out upon the dead leaves and sink my face again

"MOURNING-CLOAK BUTTERFLIES . . . ARE LAZILY OPENING AND CLOSING THEIR VELVETY WINGS"

and again into their bevy of faces, breathing deep this rarest of odors, compounded by the alchemy of sun, wind, rain, snow, and the treasures of the black woods loam. I separate the dead leaves from about them, the better to view their beauty, and uncover the bright, running stems of the gold-thread, and the coral-pink new shoots of the aromatic wintergreen.

As I bury my face once more in the flowers I suddenly become aware of a sound from a deep mossy hollow a few yards away. "Biff! Biff! Biff!"—slowly at first, then faster and faster and ending in a subdued rumble. It is the mating call of the male ruffed grouse, or "partridge". It is not a rare performance in our northern woods, but the performer is the very spirit and essence of wariness and he is seldom seen in the act. Then I begin a careful advance, slow and exacting, removing every twig from the spot where the next knee or palm is to be placed, and taking advantage of each bush and mossy hummock. Presently a few feet ahead, just above a mossy log, I catch the blur of whirring wings. Carefully, very carefully, I gain two or three feet more. Then comes a sharp, warning "Kip! Kip! Kip!" and I fear the game is finished. Further success depends upon my ability to remain absolutely rigid. How those beady eyes watch my hiding-place! Minute after minute drags by. Then, at last, the intense gaze of the bird relaxes, he brings himself into a nearly vertical position, crest erect, tail and black neck-ruffs spread. Suddenly the wings are brought forward, their outer tips nearly level with the bird's head, and releasing the air with an explosive "Biff." Faster and faster these forward strokes, the sounds finally ending in a whir of ecstasy. Again and again I watch the performance, when all at once I become aware that my muscles are crying out in protest against this rigid position kept for so long. Slowly; very, very slowly, I sink behind my bushy screen and silently stretch out on my back to relax. Far up, beyond the waving ferny boughs of the hemlocks white clouds drift across a sky of intense blue. My lungs and nostrils are still aware of those long breaths from the mayflowers. And just behind me is the whirring roll of the wild cock grouse. It is only under such rare combinations of circumstances that one feels close to the pulsing heart of all life.

Thoughtlessly I move a foot quickly. A dry twig cracks. From the mossy log comes again that "Kip! Kip! Kip!" of alarm, followed by a swift pattering of feet over the dead leaves, while from the topmost branch of a fresh-greening hackmatack comes the rollicking laughter of a ruby-crowned kinglet. Here among the children of Nature in the spring, I am, after all, only an alien and an interloper.

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Lake Michigan

By RUTH SEYMOUR VESELY

Coquette or beggar, maniac or queen—
  Lake Michigan impersonates each one:
In ruffled gown of azure, gold and green
  She shows her pretty dimples to the sun
And feeds the circling gulls, or idly croons
  To great blue herons flapping on the dunes;
With rain and lightning, she will play the hag;
  A mumbling beggar in a torn, gray cloak
Intent on stealing driftwood for her bag
  And snatching at a beachfire's fragrant smoke;
Demented by the wind, she beats the sands
  And howls, and batters ships with cruel hands.
But watchers of the Lake remember best
  Her majesty by sunset or moon's light
When sparkling gems adorn her brow and breast
  And she reveals her glory and her might;
Then thoughts of men soar free of worldly schemes,
  And lovers kiss, and dream their timeless dreams.

The Canadian Coat of Arms combines the principal symbolic devices of the British and French peoples. In this figure may be seen the lion of England, the unicorn of Scotland, the sacred harp of Erin and the *fleurs de lys* of France, to which has been added the maple leaf of Canada. Lily, thistle, shamrock and rose are combined in the floral scroll surrounding the motto

A coat of arms consists of four principal parts. These are the shield in the center; the crest, which is the device atop the helm; the supporters, usually figures of animals or people supporting the shield, and the motto. The coat of arms was originally emblazoned on the white surcoat that the knight of old wore on the top of his armor. The shield, however, is the most important part

Nature in the Royal Realm

Animals and flowers important in crests and emblems

By MAUD MACDONALD HUTCHESON

CERTAIN inhabitants of the Animal Kingdom can afford to "take fresh conceit of themselves" these days, for the forthcoming visit of Their Britannic Majesties to the New World focuses attention upon the emblems of British Royalty and the fauna and flora that have shared official status through long centuries.

"King of beasts", we call the lion, without pausing to reflect that he is the constant companion—on armorial bearings, of course—of British monarchs.

That hall mark of sovereignty, the British Coat of Arms, boasts nine lions—one holding the high honor known in heraldry as dexter, or right, supporter. Supporters, as the word indicates, are representations of animals or persons upholding or supporting the shield, which also is almost monopolized by lions—containing seven of these noble beasts—and it is surmounted by yet another lion—a crowned one, too.

The left, or sinister, supporter of Great Britain's arms has been a unicorn since 1603. That was the year in which England and Scotland united to form the Kingdom of Great Britain. Such an epoch-making event naturally called for appropriate armorial change, and since Scotland's favorite heraldic beast was the fabled unicorn he was invited to England, as it were, to appear in the armorial bearings of the Union. Two unicorns have served since early times as supporters of Scotland's Royal Arms, which remain distinct from those of Great Britain.

Following recognized heraldic usage, the Royal Standard, which is the flag that only royalty has the *right* to fly, carries the devices that appear in the shield in the coat of arms. The Standard, floating above a palace, indicates that the king or some member of the royal family is in residence. When this flag flies in England the first and fourth quarters are occupied by three golden lions on a red field. These are the lions of England, whose origin lies shrouded in a fog of antiquity as thick as the typical pea-soup variety. Richard I, however, the Crusading King, who is himself remembered as Cœur de Lion, is credited with adding a third companion to two lions adopted by William the Conqueror and Henry II respectively. Anyway, there were only two lions before the time of Richard the Lion-Hearted, but a third appeared on

his shield in 1194, and all three remained henceforth.

The second quarter of the Standard is inhabited by the Scottish lion—a single red animal rearing himself against a background of gold. When royalty resides in Scotland, however, and the Standard flies over Balmoral, it is the *Scottish* lion that appears in the first and fourth quarters, with his English cousins in the second, and the sweet-strained Irish harp keeping its accustomed place in the third. This arrangement also dates from 1603, when the Scottish King James VI (Mary Stuart's son) succeeded to the throne of England upon the death of Elizabeth. A hot controversy arose as to which nation's lion should have premier place in the arms, and a compromise was reached whereby the English lions have it in their country, while the Scottish lion enjoys it north of Tweed.

A mere glance is sufficient to show that the lions in the royal arms are noticeably different. The English group are known in heraldry as statant guardant—that is, they have their heads facing outwards, towards the left. Their Scottish cousin, on the other hand, is what heraldic experts call the lion rampant. He stands erect, with jaws wide open and claws extended in a regular fists-up attitude!

Another distinctive feature of Scotland's lion is that he rears himself within a floral tressure or inner border, adorned with *fleurs de lys*. According to one explanation, this commemorates one of the oldest friendships in history—that which bound France and Scotland together for more than eight centuries.

THE ROYAL CREST OF SCOTLAND

Two years ago, when new money was issued, King George VI had the Scottish Royal Arms placed on the shilling. This is in tribute to his Scottish Queen. The two supporters on the Crest are unicorns and are particularly Scottish, having made their way into the Coat of Arms of Great Britain after the union. The unicorn, of course, is a fabulous beast, with the body of a horse, hind legs of an antelope, tail of a lion and sometimes the beard of a goat. Its chief feature is its long twisted horn

THE COAT OF ARMS OF GREAT BRITAIN

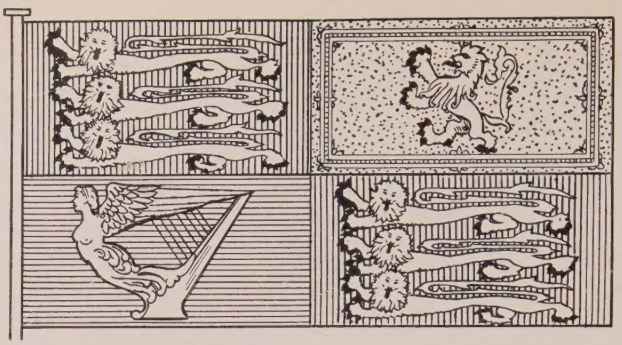
Although this symbol has undergone many changes during its history, it attained its present form during the reign of Queen Victoria, and has remained as above ever since. A lion for England and a unicorn for Scotland support the shield, which is quartered to show, in the first and fourth quarters, the three lions of England; in the second quarter their solitary cousin of Scotland; in the third quarter "the harp that once through Tara's Halls. . . ." Rose, thistle and shamrock decorate the motto

Heraldry, the science that deals with the emblematic use of animals and flowers, employs an archaic language, abounding in words like *gules* for red and *or* for yellow, yet from time to time it presents a strikingly modern viewpoint. Such an instance occurred in Scotland within the last few years. In 1932 the manager of a Stirling picture house who displayed the lion rampant from his place of entertainment was ordered to take it down, on pain of possible beheading! An ancient statute provided for this penalty when common or ordinary individuals flew the royal flag. It was still on the statute books, and the patriotic cinema official was so advised by the Lyon King of Arms. He is Scotland's Chief Heraldic Officer, and Lyon, by the way, is just an obsolete spelling of lion. (The lion on the royal shield gives its name to the Lyon Court, Edinburgh's equivalent of the Heralds' College in London. The Court's jurisdiction extends to such matters as coat armor and precedency and the reading of Royal Proclamations in the Scottish capital.)

Well, the matter dropped until the coronation of a new King was in the offing, and a prominent Scottish newspaper took up the question of the people and the lion rampant versus the heraldic experts "and other pedants."

The upshot was the publication of a letter, written at the instance of Mr. Ramsay Macdonald, on November 12, 1936, from which it was disclosed that the Lord Lyon had already

been advised to "haud his hand." "Although at one time objection was taken on heraldic grounds to the display of this flag", said the letter in question [since] "the Lion Rampant Flag made a strong appeal to Scottish sentiment, in September, 1934, a Royal Warrant was issued to Lyon King of Arms directing that henceforth no official cognizance should be taken of the display of this flag by His Majesty's loyal subjects." This viewpoint now obtains.



THE ROYAL STANDARD

This is the flag that only royalty has the right to fly, although it is used for decorative purposes. Flying over a palace it signifies that the sovereign is in residence; broken from the mast of a ship, it tells that he has come aboard the vessel

Since King George is also sovereign of Canada, the beaver, which shares heraldic honors in that country with the maple leaf, can claim royal status too.

Canada has a valid enough reason for honoring this industrious little fellow. It was the pursuit of the beaver, for its skin of silken softness, that opened up the country to exploration. The famous Hudson's Bay charter, granted in 1670, stipulates that the company must present a pair of black beavers and two live elk to any British monarch who visits Canada. For the first time in the ensuing two and a half centuries of history this tribute will be paid at the city of Winnipeg on May 24 of this year when King George will accept two beaver skins and two mounted elk in lieu of the live animals!

THE SHIELD OF SOUTH AFRICA

Supported by two native animals, the shield is surmounted by the lion and shows in its quarters a figure of Hope with an anchor; black wildebeests for Natal; an orange tree for the Orange Free State; a trek wagon on green for the Transvaal

On Canada's Mace, symbol of parliamentary authority, a beaver stands out in bold relief beside the royal crown. Then, for the past two years the beaver has shared kingly society on coin of the realm. He appears on one side of the King George VI Canadian nickel, with the sovereign's head, of course, on the other. This new currency was issued just prior to the Coronation, and the honor paid the beaver was most fitting. In the early days of Canadian history beaver skins represented cash and long served as a standard of exchange.

Of even greater antiquity than armorial bearings are floral badges. The rose has been England's flower since the late 1200's, when Henry III's Queen introduced the golden rose of her own fair land into the national insignia of her husband. She was Eleanor of Provence, and as a lady of exalted rank she was armigerous—that is, she had the right to retain her own coat of arms, and pass it on to her children. Indeed, the interchange of family emblems makes heraldry a pictorial record of history.

The golden rose came to grief with young Richard II, and after his abdication England's favor swayed between roses of two contrasting shades. The Wars of the Roses—red for the House of Lancaster, white for the House of York—finally closed on a romantic note. Henry Tudor of the Lancastrian line consolidated his position as Henry VII by marrying the Yorkist heiress, Elizabeth, and thereafter the rose was the symbol of English unity.

Scotland's floral symbol is the thistle—familiar as a tuft of pinkish purple embedded in a green cup. The spiky leaves are expressive of the motto in the Scottish Royal Arms—*Nemo me impune lacessit*—No one touches me without being punished, or meddle wi' me wha dare!

Tradition places the adoption of the thistle as the national emblem of Scotland in the year 1263, date of the famous Battle of Largs. The Danes who had effected a landing on the Scottish coast proceeded in silence under cover of night, intending to effect a surprise attack. Everything was working out according to schedule and the invaders were nearing their objective when one of the barefooted soldiers stepped on a thistle. His cry of pain roused the Scottish army who drove King Haco's Danish hosts in confusion back to their ships.

The story *sounds* logical enough, although it has never been proved. The thistle, however, did appear in the country's coinage as early as 1475, during the reign of the third Stuart James, and the establishment of the Order of the Thistle assured its place as the national emblem. The Order of the Thistle is to Scotland what the Order of the Garter is to England, and is thought to have been *originally* founded in 787!

When King George and Queen Elizabeth paid their post-coronation visit to Scotland in July, 1937, and held court in storied Holyrood, the outstanding ceremony in the royal program was the installation of Her Majesty as first lady of the Most Ancient Order of the Thistle. The scene of this investiture was the Thistle Chapel of St. Giles Cathedral. Representatives of every noble house in Scotland were present, including the Queen's parents, the Earl and Countess of Strathmore.

Interestingly enough, the Strathmore family crest con-

tains a lady "holding in her right hand a thistle". Both have been there since the late fourteenth century when Sir John Lyon married the princess Jean, daughter of Robert II of Scotland, and founded the present Bowes-Lyon line.

For the shamrock, as the national flower of Ireland, legend would claim its connection with Saint Patrick, who is said to have used it to illustrate the doctrine of the Trinity. The harp, symbol of the ancient Irish Kings, went into the discard for centuries, and it was none other than Bluff King Hal—Henry VIII to be more formal—who reintroduced it into Erin's flag.

In the floral scroll, which decorates the motto, *Dieu et Mon Droit,* in the present British Coat of Arms, the rose, thistle, and shamrock are beautifully entwined.

Heraldry had been called "the shorthand of history", and nowhere is this phrase better illustrated than in the arms that the British Dominions have achieved for themselves in modern times. The Canadian Coat of Arms, for example, adopted as recently as 1921, links the old and the new in Empire story, while a similar purpose is served by the armorial bearings of Australia, New Zealand and South Africa.

THE ARMS OF AUSTRALIA

Kangaroo and emu serve as the supporters on this emblem. The shield is divided into six parts, each representing a State in the Australian Commonwealth. The crown appears twice and the English lion twice, while the black swan and the piping shrike occupy the two remaining sections of the shield. New Zealand places evidence of her industries on her arms

In planning a national coat of arms for Canada, consideration was given to the fact that the Dominion as it stands today represents the fusion of two great races, British and French, and that the British themselves are composed of three separate peoples—English, Scots and Irish. A section of the shield has therefore been reserved for the ancient emblem of France—three golden *fleurs-de-lys* on a sapphire blue field. A flag of similar design is held proudly aloft by the unicorn, which acts as left supporter, while the right supporter is a lion upholding a Union Jack.

The royal lions of England and Scotland and the Irish harp each occupy a section of the shield, while the whole lower third is "differenced" by a green three-leaved sprig of maple. In the handsome floral scroll that decorates the motto, the English rose, the Scottish thistle, the Irish shamrock and the lily of France's ancient régime are entwined round the words *A mari usque ad mare*—from sea to sea.

The lion that surmounts the shield holds in his paw a red maple leaf, symbol of sacrifice. It was to the tune of "The Maple Leaf For Ever" that many of the country's sons marched away to the World War.

A kangaroo and an emu serve as right and left supporters of the Australian Coat of Arms. Both animals are regarded as typical of the country. The emu is quite an oddity—a *flightless* bird, whose feathers seem to have a double form. Two plumes spring from one quill. The Commonwealth's shield is divided into six parts, two of which are given over to the English lion, two to the royal crown, while a piping shrike and black swan occupy the two that remain.

New Zealand has chosen to honor her industries in her national arms, which feature a wheat-sheaf, a fleece, and the crossed hammers of manufacture.

The quarters of the South African shield are reserved for black wildebeests in the case of Natal, a figure of Hope with an anchor for Cape Colony, a trek-wagon in a green field for the Transvaal, and an appropriate orange tree for the Orange Free State. A royal lion surmounts the shield.

In the new Rhodes House at Oxford a curious figure known as the Zimbabwe bird shares in the decorative scheme with the anchor, the maple leaf and the southern cross. Found among the ancient carvings at Zimbabwe, the bird so interested Rhodes that he took it for his own emblem. Through its transfer to the headquarters of the Rhodes Scholars in old-world Oxford, Rhodesia has made a real contribution to heraldry as a continuing science.

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Copies of Volume Two, Number Two of the *American Nature Association Quarterly Bulletin* are now available to members on request. This issue is devoted to an illustrated report on the progress of roadside control in New England.

HE IS KNOWN TO SCIENCE AS *MYOCASTOR COYPU*

Except for his tail, which is quite rat-like, he definitely suggests the beaver, but there is nothing commonplace about this South American animal

The Beaver-Rat—Neither Beaver nor Rat!

By ELSIE A. PARRY

Photographs courtesy of Bourquiny Kohlmann

THE COAT was undeniably good-looking—a warm, soft material in a lovely shade of moss green. The collar of brown fur had a deep, rich pile.

"What sort of fur is this?" I asked the saleswoman. "It looks something like beaver."

"It's nutria . . ."

"Nutria?"

"Yes, South American rat . . ."

My interest in the coat evaporated on the spot. I decided then and there, actuated by one of those suddenly acquired prejudices common to sixteen-year-olds, that I was not going to wear the fur of a rat around my neck, be it ever so warm and soft.

It was thus that I first made the acquaintance of the nutria. Years were to pass before I was destined to meet the creature again, in the flesh this time. And I had to travel some six thousand miles to Argentina in order to say "Howdy!" to him. But one look at his noble array of bristly whiskers convinced me that, rat or no rat, he merited further acquaintance.

As a matter of zoological fact, the nutria, so-called, is neither a nutria nor a rat. He is not a nutria because that is Spanish for otter, which this beast is not; and he is not a rat, although he might pass for one, but is, instead, a not too distant cousin of the porcupine. *Myocastor coypu,* to address him properly, is a rodent belonging to the family Capromyidae—coypu, for short. The Indians of Paraguay call him *guiya.*

The early explorers of central and southern South America, who naturally used the river highways whenever possible, soon discovered the coypu—could hardly have missed him, as a matter of fact, for this large and numerous rodent is no landlubber. The waterways of southern Brazil and Chile, of Paraguay and Argentina are his home. The South American Indians, of course, were well acquainted with the coypu long before the white men came. They used his fur and ate his flesh. W. H. Hudson writes of having found his bones in kitchen middens near the Rio Negro in Patagonia. A sixteenth century visitor to Argentina wrote: "Near Bonas Aeieres, that is, in German, *Guter Wind,* we found a place inhabited by Indian folk named Carendies. . . . At this place of theirs we found nothing but furrier-work made from the coypu or so-called otter. . . ." The writer of the anonymous *Treatise of Brazil* (1601), which is included in *Purchas, His Pilgrimes,* speaks of "ten or twelve kinds of Rats, all good meat. . . ." Undoubtedly one of the "rats" was the coypu, which was "everywhere to be found" and whose flesh was so "white and well-flavoured."

A later traveler mentions seeing them in Brazil, in the market stalls of a little town in the interior, "spitted on wooden skewers, roasted and ready for eating." And, still more recently, an observant European wanderer found wide bands of coypu fur being used as below-the-knee "garters" by some Brazilian Indians who were otherwise quite unadorned. Inquiry elicited the information that the oddly-located and apparently useless contrivances had something to do with warding off snake-bite!

With tail concealed, coypu would be an excellent "stand-in" for a beaver; but one look at the long, round, scaly tail with its thin coating of short hairs would convince the average person that the appendage could belong to none other than a big rat. Indeed, perplexed observers, not scientifically inclined, have dubbed coypu the "beaver-rat." But a rat from twenty inches to two feet in length, exclusive of tail, weighing in the vicinity of ten pounds, would be considerable rat, whereas the specifications are just average for coypu. On several occasions

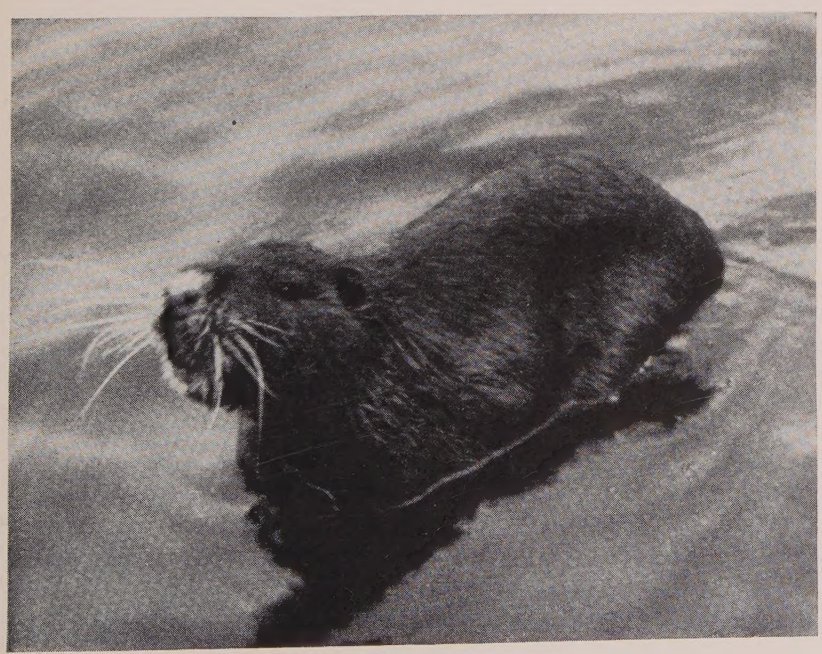
COYPU IS IMPORTANT AS A SOURCE OF A WARM, SOFT, GRAYISH-BROWN FUR
Close to half a million skins are collected annually but the animal is extremely fecund and, once protected, increased to great numbers

showmen of the Barnum persuasion have foisted specimens of the coypu upon an unsuspecting public with the assurance that they were phenomenal products of the London sewers! The large, bright orange-red, and extremely business-like incisors, which are outstanding among coypu's characteristics, would not shame a beaver, but the South American rodent indulges in no such large-scale gnawing activities as those for which the beaver is justly famous. He contents himself with feeding on seeds, leaves, roots, and, on occasion, shellfish.

His habitat being what it is, coypu is naturally no amateur when it comes to swimming. Webbed hind feet and a streamlined shape have assisted him in becoming proficient. His long coarse "water-hair," which is a mixture of dusky and brownish yellow, protects the dense, soft, brown underfur, the "nutria" of commerce. Coypu is so thoroughly adapted to life in the water that he plays about in it as freely as though he were disporting himself on dry land. Many observers report having seen whole colonies of them, young and old, playing in the water and "conversing together in their strange tones, which sound like the cries of wounded and suffering men." Fur-catchers take advantage of these swimming parties to shoot the rodents, after having lassoed them, it is claimed, to keep the dead bodies from sinking.

Madame Coypu and her youngsters, who make their homes in holes in the river banks or in platform-like nests among the rushes, are not stay-at-homes by any means. They go off on swimming excursions even before the latter are weaned. The little ones, eight or nine of them, climb aboard mother's back and hang on for dear life while she swims rapidly along, cleaving the water with her sharp, white-tipped muzzle. If a youngster falls off, he swims madly in pursuit of his living ferry-boat, crying pathetically the while. If he gets hungry, he feasts as he rides, for a kind providence has set his mother's nipples high on her sides, the foremost one behind the shoulders, the last one in front of the thigh. An unusual and highly convenient arrangement!

There is nothing really commonplace about the coypu. Scientists have scratched puzzled heads in their efforts to account for some of his doings. They would like to discover, for instance, how he managed to reach the Rio Chupat in southern Argentina. To get there he had to leave the Rio Negro and migrate one hundred and seventy miles southward across level, extremely arid, almost desert plains, which is something of a feat for an aquatic creature that is poorly adapted for land travel. The scientific gentlemen would like to know, moreover, by what alchemy of adaptation the coypu transforms himself, with no apparent change in his bodily structure, from a fresh-water vegetarian into a salt-water eater of



COYPU IS ACCOMPLISHED AS A SWIMMER, ESPECIALLY IN FRESH WATERS
He has webbed hind feet and a streamlined body. The mother takes the young along. They, clinging to her back, feed en route from nipples high on her sides

shellfish. In the Chonos Archipelago, which is located off the southern coast of Chile, this accommodating rodent takes kindly to life in the salt water bays and channels that extend between the rocky islets of the region. He digs his burrows in the forests that border the beaches and tries out his competent incisors on the shellfish that live along the shore. Even Darwin called this astonishing rearrangement of habit "a far from common occurrence."

The fur traders, of course, have never interested themselves in coypu's zoological idiosyncrasies. To them he is merely an abundant source of excellent fur that can be used "as is" to make a good imitation of beaver, or that can be dyed to make "seal." The skins are "pulled" or unhaired to remove the long coarse waterhair. The less desirable pieces of fur are used for cutting or hat purposes and are sold by the pound. From 300,000 to 500,000 skins are collected annually, no small contribution to milady's vanity. By a curious twist of fate thousands of North American beavers and muskrats owe their lives to coypu. The South American rodent is so prolific and his fur commercially so adaptable that he has been relentlessly slaughtered in preference to the more expensive northern animals. Only his fecundity has saved him from extermination. W. H. Hudson tells a curious story relating to the coypu and his breeding habits. It seems that about the middle of the nineteenth century the Argentine dictator, Rosas, issued a decree prohibiting the hunting of the coypu. The result was that "the animals increased and multiplied exceedingly and abandoning their aquatic habits, they became terrestrial and migratory, and swarmed everywhere in search of food. Suddenly a mysterious malady fell on them from which they quickly perished and became almost extinct." It would, however, be possible to over-gather these animals and endanger the species.

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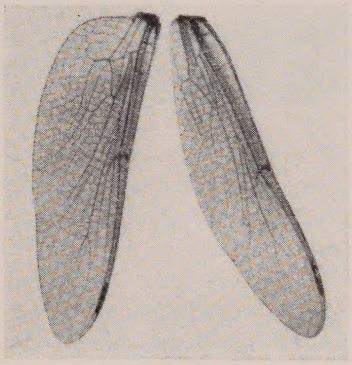
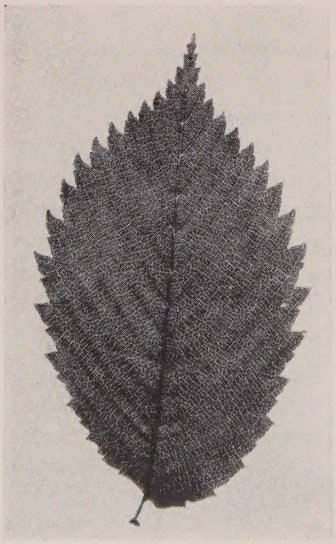


Photography Without a Camera

By JOHN WILLARD BAECHLE

An interesting phase of photography is the making of pictures without the use of films or camera, a process simple for anyone who prints his own pictures. In making prints of leaves and insect wings, for example, results are in some respects superior to ordinary camera shots, bringing out detail. Wings or leaves must be perfect specimens, and pressed and dried, otherwise the ribs and veins will prevent perfect contact in printing and pictures will be "fuzzy," and therefore undesirable.



When the specimen is placed right side up in the printing frame and a print is made in the usual way, the result will be a negative, or white-on-black print. Single weight, glossy paper must be used in making this first print, which is then used as a negative from which any number of positive prints can be made on any kind of printing paper desired. In making the positive print, the original negative print should be placed right side up in the printing frame. If the exposure required to make these positive prints is too long, it may be shortened by coating the back of the negative print with some light machine oil, and carefully removing all surplus oil with a tuft of cotton. This oil will render the negative print more translucent and thereby shorten the exposure time.

The pictures made in this way will naturally be exactly the same size as the original specimens. Larger or smaller pictures can be obtained by making the first, or negative print, by projection, and the positive prints by the contact printing process from the enlarged or diminished negative print. This same method can be used to advantage in copying maps, music, written or printed matter, providing the material to be copied is present on only one side of the original paper.

RICCARDS CLIFTES, NOW CALVERT CLIFFS

PHOTOGRAPH FROM THE AUTHOR

Not far from here, one night in 1608, Captain John Smith anchored his little discovery ship. Here the modern exploring geologist finds the bones of long extinct species, laid down when the ocean covered this region

ANCIENT INHABITANTS OF SOUTHERN MARYLAND

By CHARLES T. BERRY

CAPTAIN JOHN SMITH was a man of vivid imagination, much given to exaggeration and conceit; but not even in his wildest moments could he have conceived the strange beasts that once inhabited the country he was exploring. On one of his various trips, in 1608, he laments the lack of fresh water on the "Iles" and the "Eastern Shore" and remarks, "so broad is the bay here, we could scarse perceive the great high cliffs on the other side; by them we anchored that night and called them Riccards Cliftes".

In 1939 it is Riccards Cliftes, now called The Calvert Cliffs, that especially concern one type of modern explorer—the geologist. From the bay they present much the same appearance as they did when Claibourne traded near by, or the Calverts sailed their ships on these waters. On the shore things have changed since Smith's day. Now clusters of summer cottages with little docks jut out into the water, with canoes and rowboats beached at the base of the cliffs, two hundred feet in height. Small children in bright bathing suits run tirelessly back and forth collecting small shells, pebbles and sharks' teeth or, perhaps, a piece of dark brown bone.

The geologist visits the cliffs today to learn about the fauna and flora of the country—those forms that existed approximately ten million years ago, in an epoch of geologic time known as the Miocene. Here he finds evidence that great turtles and whales and sea cows, and strange birds and plants, lived in the waters of a Miocene sea that covered practically all of southern Maryland.

The geologist has scant knowledge of the ancient birds, for their bones, hollow and fragile, were easily crushed, and very few good specimens have been described. Among these is a species of gannet, much like a modern gull. It was at home flying at sea, or waddling along shore searching for its food. Another type of Miocene bird was a large auk, having very rudimentary wings. In all probability this great-grandfather auk associated with the marine turtles and the sea cows of that period. A few other types of ancient birds have been discovered.

These birds could look down from their heights on

the roaming rhinoceroses, share the sunny beaches with the crocodiles and turtles, or watch the sea cows swimming slowly about in the lagoons. The rhinoceros remains consist of several milk teeth—the first to be discovered in Miocene beds in eastern North America. These beasts, contemporaries of the first horse, appeared in the world during the Eocene, being about thirty million years ago, in the western part of the United States. During subsequent geological periods they spread throughout the world, but disappeared in North America during the Pliocene epoch, about six million years ago. Today four genera only are found surviving in Africa, southern Asia and in the Malay Islands.

Inhabiting the same lagoons with the crocodiles were the sea cows or manatees. These mammals were entirely herbivorous, eating the aquatic plants and algae on the sea-bottoms. They appear to have originated during the Middle Eocene time in Egypt, and, nearer home, in Jamaica, whence they spread throughout the world. Today they are found only along the Atlantic shores of Africa, the West Indies and tropical America—and their numbers are decreasing due to destruction by man. Miocene manatee remains dug from the Calvert Cliffs include ribs, vertebrae and shoulder blades. The present-day sea cow is much like his Miocene ancestor. He is a bulky beast with two front flippers, a short chubby face, and a broad, flat tail. When he swims he propels himself solely by his tail and when he is at rest his body is generally arched with the tip of the tail resting upon the bottom.

PHOTOGRAPH U. S. NAT. MUSUEM

A FOSSIL TURTLE FROM AQUIA CREEK, VIRGINIA

This is *Amyda virginiana*. When found, this upper shell was in fragments that were patiently matched together. The scale represents one foot

If the manatee ventured too far out into the open lagoons or the river mouths he was apt to encounter the great sharks and other large fishes that were his arch enemies. The Miocene sharks, not unlike our present ones, first appeared in the world many millions of years ago in the Silurian period. Since then these primitive sharks have passed through diverse evolutionary stages, splitting up into two main groups—the true sharks and the rays—during the Jurassic, about seventy-five million years ago.

Both were very numerous in the Miocene seas and in a single day's hunt one my pick up along the Calvert beaches enough of their teeth to fill a cigar box. The bones decay quickly and consequently are not readily fossilized.

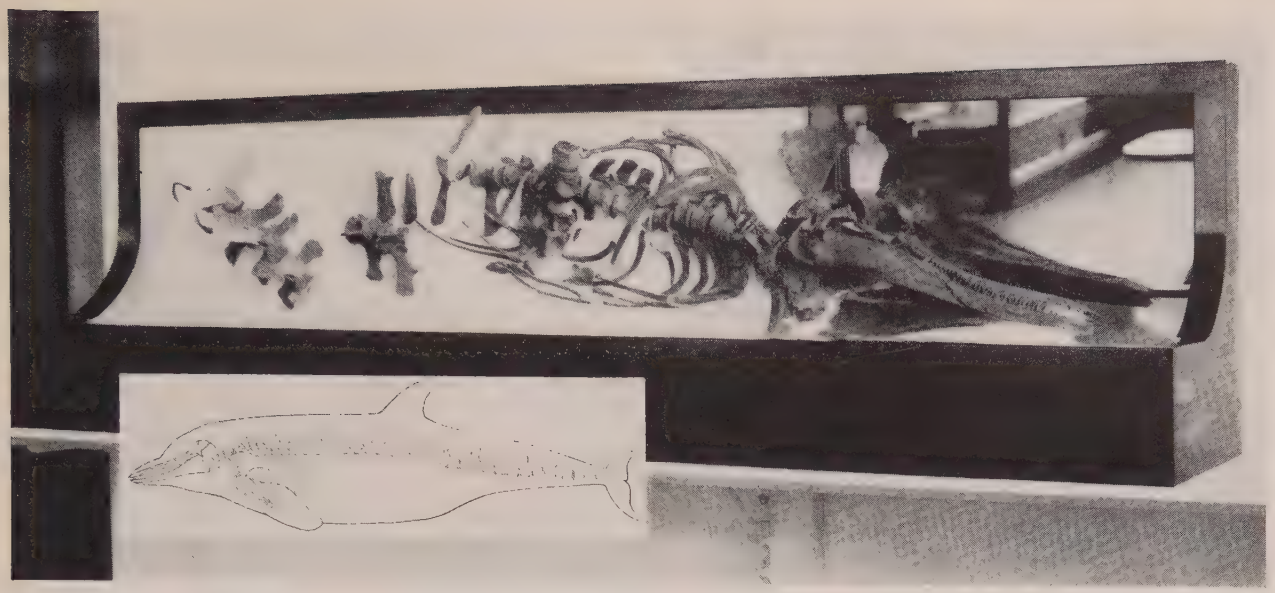
On the narrow beach at the base of the Calvert Cliffs the geologist often finds large vertebrae, sometimes measuring six inches across. These originally belonged to whales that inhabited the region during the Miocene. These vertebrae are of little value unless associated with other parts of the animal. More significant are the numerous fossil whale skulls. Some of these are nearly six feet in length, while the more common ones are about twenty-four inches long.

Fossil cetaceans from the Miocene of Maryland can be classed roughly as toothed whales and whalebone whales. Since early times their skulls have become so modified that the fossil remains seem quite different from the skulls of the modern mammal. These two groups of whales are today mainly confined to the colder parts of both hemispheres.

In these same Miocene seas lived the first cousins of the whalebone whales—the porpoises. It is not uncommon to find the skulls of porpoises partly exposed in the face of the Calvert Cliffs. These mammals were much smaller than the larger whales and some of them had long, narrow snouts. Their closest descendants are the river porpoises found today in South America and China. The fossil whales of those days were the ancestors of those that supplied our grandfathers with oil for their lamps.

Fossil remains show that five families of turtles inhabited this region during the Miocene, two on land and the others in the open seas. One of the fresh water forms had a peculiar habit of doubling up its neck sideways when it wished to retract its head; his descendants have been given the descriptive name of "side-necked turtles". This type originated during the Cretaceous (about fifty-five million years ago) and ranged widely until the Pleistocene (about one million years ago) when the great ice sheet advanced over the northern hemisphere. This necessitated migration to warmer regions, and side-necked turtles are now found only in South America, Africa and Australia. Their wanderings provide evidence of shifting land surfaces, for these turtles swim only in fresh water, avoiding salty or even brackish water. To reach Africa and Australia they had to use land bridges that disappeared ages ago.

Just off shore ranged the marine, or salt-water turtles, which sunned themselves and laid their eggs on the sandy beaches. These ancient marine turtles have given us the present day leather-back turtles, whose backs are covered by leathery skin.



A SMALL TOOTHED WHALE IN ABOUT THE CONDITION AS FOUND

PHOTOGRAPH U. S. NAT. MUSEUM

This is *Kentriodon pernix*. Its total length was nearly six feet. The insert shows approximately the shape of the living animal

In the lagoons and on the bordering sand flats were crocodiles, as hideous as their modern great-great-grandchildren. They first took on a crocodile form during the Jurassic period (when birds first appeared) and wandered through the world, dying off in all parts except in Africa and in the Asiatic regions where they are living today. That these early Miocene crocodiles were carnivorous, like their descendants, is proved by the conical teeth, which are often found in the deposits of this period.

Across the muddy bottom of the shallow Miocene sea scuttled numerous crabs practically identical with the living modern blue crab species. Associated with these Miocene crabs were the Miocene oysters, much like our own, *Ostrea virginica*. Many other mollusca, both of the clam and snail types, crawled about the shallow depths of the Miocene sea, and their representatives are now found in our warmer waters. These ancient mollusca were troubled, like the present oysters, with grains of foreign matter that entered their shells, causing pearls to form. Fossil blister pearls that reached the size of about one cubic inch have been found in certain shells. The luster of these pearls, of course, has been lost during fossilization, and their only value lies in their oddity.

Some ancient bones of the Chesapeake carry fossil barnacles, showing that they had lain long on the sea bottom before they were covered over by mud and sand. Some of the Miocene barnacles were several inches high, but the more common ones resembled those that one finds today along the shore. Corals also grew abundantly in Miocene times, for evidence of small coral reefs can be observed here and there. These animals required very clear water in order to live.

The geologist's knowledge of the type of plants that existed here during Miocene time is limited. He does know, however, that walnut trees grew there, for fossil nuts have been found, and cones of scrub pines are found just back of the sandy beach.

As shown by the thick beds of plant remains, the sea in early Miocene swarmed with marine plant life. This earth is composed of microscopic plants called diatoms, tiny plants that still occur in incredible numbers.

The Calvert Cliffs are watched continuously for new discoveries by geologists from institutions in Washington and Baltimore. After each severe storm explorers comb the thirty miles of Cliffs, hoping that the storm has uncovered new bones or shells, new pieces in the jig-saw puzzle, which, completed, will reveal a detailed picture of life as it was lived in southern Maryland ten million years ago. The geologists are often successful and new discoveries of importance are made each year.

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Fire Bird

By GEORGE E. MOORE

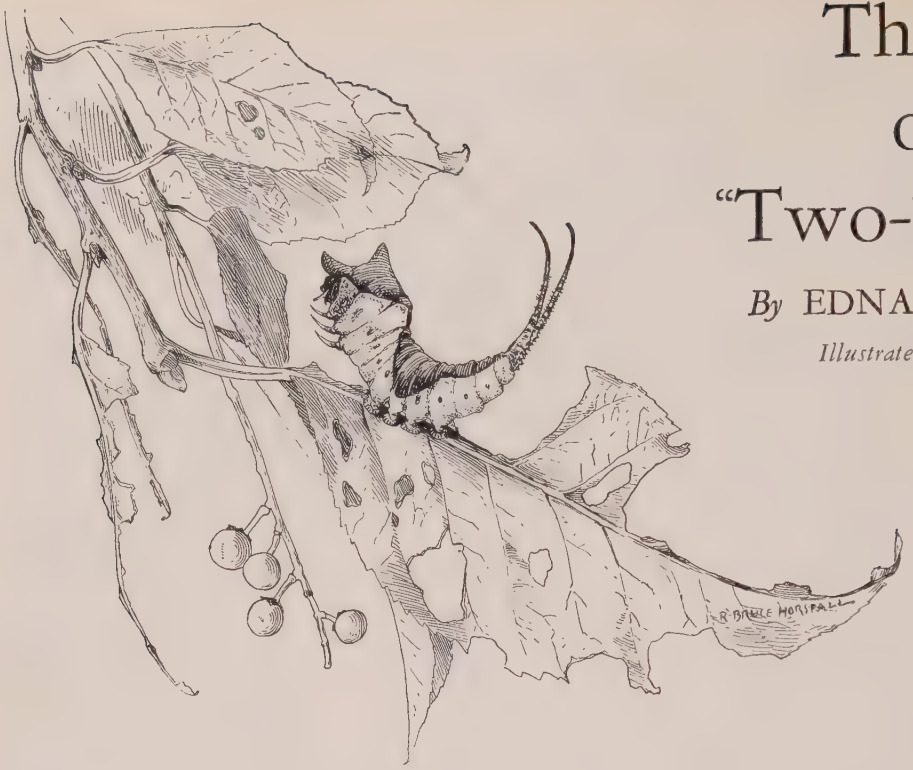
From out a diamond-studded sky
A myriad falling stars flashed by—
A-wink like fireflies at play
Some left a trail across the way,
Some fell into the trees.

And when a new day brought the sun,
It seemed a cedar had caught one,
For bright against an evergreen,
Just where the falling star was seen,
There flamed a Cardinal.

The Affair of the "Two-Tailed Cat"

By EDNA PECK ATWOOD

Illustrated by R. Bruce Horsfall



A CATERPILLAR WITH A DOUBLE "TAIL", "EARS" LIKE A CAT, AND A BROWN SADDLE

It proved to be the larval form of a moth known as the northern harpy. The first one died from the effects of a parasite, which established a colony cocoon as is seen below. Other specimens, later acquired, survived

FIRST acquaintance with the subject of this record came one mid-August morning when I was gathering fresh twigs for the larvae of my insectary. In the bush-fringed edge of the timber I paused at a small wild cherry tree. There, just as I was turning away, a curious creature in the center of a leaf arrested my attention. I still remember how incredulously I stared at the discovery; how gingerly I detached the twig to which his leaf grew; and how, blind to all else, I bore him homeward, exclaiming as, one at a time, his oddities dawned upon me. "What a queer tail! Why! he has *two* tails! And 'ears' like a cat's! And a brown saddle! Well! of all things—a saddled 'cat o' two-tails'!" Thus was he christened, and thus was he temporarily known.

None of my family, not even my observant father, had ever seen such a caterpillar before. The voluminous insect manual held no hint of his existence. Six true legs he had, and eight pro-legs, while surely that elaborate v-tail, that would open and close, more than compensated for a pair of missing prop-legs. Such a tail! It was finely saw-toothed like the legs of a grasshopper, and it was marked alternately with rings of brown and yellowish-green. I tickled his back with a bit of knitting wool and the tail went into immediate action. Up it rose, a ready whip, spreading wide and lashing back and forth and sidewise, even beyond its owner's head. A little, velvety-looking, black filament issued from each tip and curled about menacingly. Out of reach, I was thinking: "That looks effective for repelling enemies. Whoever said that a cat has no use for *two* tails never saw *this* one."

Left alone, the "two-tailed cat" soon returned to rest, placid on his pro-legs with both extremities of his body elevated. Again his tiny, hooked true legs hung motionless under his chin and again his extraordinary dual "tail" closed like a book. He was so quiet and well mannered, so unperturbed by curious glances, so like some nice, old cow that, if he had been caught chewing a cud, no one would have been surprised. An abundance of his favorite wild cherry was all that he asked of life. He grew and waxed plump and his color changed from brown and green to brown and yellow. The prominences, or "ears", that had been slightly hairy, showed no trace of down. He must have changed his skin in the night and then eaten the cast-off coat. No vestige of it remained.

For exactly three weeks he was my most cherished treasure. The watchful care lavished upon him was then repaid with a quite involuntary legacy. His last days were logy, appetiteless ones. He just clung to a leaf and moped. I watched him more closely than ever, thinking he planned either a chrysalis or a cocoon. But it was neither. On the morning of September 13, I peeked at him as soon as I was up-and-about and cried in misgiving: "Why! here is a cotton ball and he *isn't* inside! He's fallen on the floor of his cage and is dy-

ing!" Mother came hurrying. Together we examined the "two-tailed cat." He was shriveled and shrunken to near half his size of the previous day. His tail, spread wide, moved feebly when I breathed upon him. About noon he died.

Yet there remained a wonderful ovoid of snowy-white down that clung about the tip of the cherry leaf. Ah! that was beautiful and feathery! When held to the light a dark shadow could be seen within. Like my now dead larva, no description of it could be found. I sent it to the highest authority of the State University, together with a detailed account of the "cat", and soon learned that it was a colony-cocoon of some species of *Microgaster,* parasitic on my caterpillar. The latter was the larval form of a moth, the northern harpy or *Harpyia borealis,* of the family Notodontidae.

Evidently the harpy had been infested with eggs of his enemy before I acquired him. To get the life-history of his species I must await another season and try to find another specimen before his enemies did.

Spring came at last. The wild cherry leaves unfolded green and succulent. I examined them in vain. Many another prized crawler I found, but no northern harpy. The search grew feverish. About this time a young friend with the same hobby gave me one of another species of harpy. (My mentor had told me of three species.) This larva was found on poplar. He was much more pronounced in color. On August 1 he spun a cocoon, working from the inside in approved fashion. His work had a tough and impenetrable look. It was of the tone of gray, weather-beaten wood.

THE HARPY EMERGES
It is a little moth, three-fourths of an inch long with white and gray markings and touches of black and orange

It was August 22 before my own quest was rewarded. On that date I plucked a twig in triumph and took proudly home a diminutive harpy. Later I found three more and repaid my friend the earlier gift. No two were of the same size. In a week the largest shed his skin and ate the shell, rigidly-upstanding but empty, tails and all—everything except the mask. He was ravenous and ate an unusual amount of cherry leaf. His color was now green and yellow. (The poplar harpy had never changed color at all.) Happily I watched him grow and prosper and great was my elation when, on September 9, his "tail" curled up like a little pig's, his skin turned to a lovely, old-rose color, and he spun a cocoon that looked exactly like that of the poplar-eating harpy. That winter three sleeping harpies were mine.

It was well that there were three of them. The first to hatch, he of the poplar, escaped through an open window. Only the tell-tale opening in the end of his cocoon betrayed the loss. The second harpy nearly died and did denude himself in fruitless effort to crawl from his wrappings. Help came in time but he was worthless as a model. The third was captured just as he emerged and developed in perfection. He was considerate enough to pose for sketches. He was three-fourths of an inch long and was white with gray markings. He also had touches of black and orange. Thus at last were the chronicles of the northern harpy completed, although three seasons were required for the task.

Reverie

By HOWARD P. BARTRAM

Give me the trail to the old lagoon
That I loved in the days of yore;
And give me the drift of a gray canoe
And the hint of a dream-drenched shore;
And give me a rod and a singing line
And an age-long sip of the balsam wine.

Dawn in the Swamp

By HIRAM JEFFERSON HERBERT

SUDDENLY, our senses become alert. The awakening swamp becomes a surging, teeming place, with clamorous meaning yet strange, wild, and full of eloquent mystery. From our blankets on the platform raised above the soggy island, we see a gray sky as perplexingly deep as all the firmament. A band of wild ducks rushes across our upward vision, a weird, unchallenged whistling in their wake.

Suddenly the gray ceiling is blasted by a band of light from the east, setting fire to the cypress heads. The swamp glows with the wild energy of creation. The hanging moss turns to rich purple fringed with more gold, royal and gleaming against the black water; from afar a pileated woodpecker sounds his matutinal telegram. The wind again in the cypress heads—but, no, it is an ibis lazily beating the air.

Then, with even more suddenness, the sun ball itself follows its heralding rays, boils up with the mystery of fire on a land of water, and the Palæozoic lifelessness of predawn becomes rampant with the warmth of living things. Strange movements point the still, steamy air. A musical splash of water tells of pursuit, of flight, of play. A white egret lumbers across the opening between the cordons of cypress, his lazy argent wings nearly tipping the bonnets.

Thus does day break over the swamp, a realm of twilight, of harsh persistence to survive. There is the torpor of saurian existence and movement. In these great American swamps we find page after page of ancient hardihood, monstrous tactics, strategic upheavals, and as we move about, becoming familiar with the life itself, we find it easier to comprehend the necessary antiquity of time.

Strangely, these great swamps are called wastelands; useless; handicaps to the "civilized" progress of our day. But in the realm of natural history nothing could be more fortuitous, for in these watery places nothing matters save the sharp, yet tedious, process of evolution. Here is a twilight land of original life; testing ground from which the fitter forms come forth to people the ever-changing world.

For here we find things struggling to adapt themselves, other things in perfect accord, and still others apparently lingering as if pondering over their capacities to survive in the higher order to which they are destined. Here animalculae float like suspended animation; here silent fishes; above the osprey screaming defiantly over his domain. Here reptiles bask lazily in the sun, contemptuous of the life around; the velvety-graceful wildcat snarls at the bald-faced moon while the white-tailed deer confounds gravity by her long leaps. Sphagnum thickens the water. Here is the dawn; the day; the twilight; the night—but always here is struggle and uncertainty, always new beginnings.

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Need of Mountains

By L. MOULTON

There are times when my mind needs mountains
As a dolphin needs the sea,
As a rainbow clamors for fountains,
Or days for eternity.

There are times when peaks seem essential
To a thought's exploring flight;
Exalted snows are potential
Kindlers of soul's inner light.

There are times when my mind must go climbing
As an eagle must use its wings,
As words invoke music in rhyming,
Or the thrush of necessity sings.

Some Spring Flowers

PHOTOGRAPHS BY DEVEREUX BUTCHER

The announcement that Jack-in-the-Pulpit is preaching calls all flower lovers of his parish to worship, for the beauty of this strange plant is a lure whose possession many human preachers might well envy. No matter how many times one has seen this miracle sprung from the wintered sod, he is eager to see it anew. This series of photographs shows well the successive stages assumed by each plant. The picture of the matured plant is much reduced, and a plant in bloom may attain a height of only a few inches, or as much as three feet.

Sometimes in moist sand, but more often in springy, but well-drained ground, soon to be in shade, the eastern adder's tongue, *Erythronium americanum,* blossoms in early spring in our eastern forest region. It is most commonly, perhaps, and least appropriately, called dog-tooth violet, a name brought by the pioneers. In some places, it is called fawn lily, and trout lily. About the flowering plants, with their paired and spotted leaves, are always found a lot of single leaves, smaller and unspotted, for the tiny corm that comes from the seed must have several seasons' growth, each summer burrowing a little deeper, before it becomes robust enough to nourish the bloom and fruit.

When the tightly-folded and fragile leaves of this perennial plant, the May apple, are pushed up from the newly-thawed ground, in April or May, one cannot help wondering why the life is not crushed out of them forever. But almost the next day the twin umbrellas are spread for the spring showers, each as perfect as if it had never been underground. The pure white flower, here shown much reduced, gives rise in time to a lemon-shaped sweetish fruit. Children eat them, and we have known them to be made into preserves. We must confess that we always doubted the wisdom of this latter procedure in a country so rich in potential material for sweetmeats.

The perfoliate bellwort, *Uvularia perfoliata,* with its yellowish delicately scented drooping flowers, ornaments the May woods with its graceful beauty, appealing more to the mind than to our direct senses. Amid the lusher growths it is sometimes so inconspicuous as to demand careful search.

When we greet each spring, and see the beautiful flowers of the Dutchman's breeches, we cannot but wish that another of its country names, white hearts, had not gained favor. Like its relatives, squirrel corn, bleeding heart, and the pink and yellow corydalis, it seems too dainty for its popular name, even though the unmentionables be starched and pressed so faultlessly.

The large whorled pogonia, *Isotria verticillata,* lives in wet or semi-dry woods throughout our northeastern States. Its inconspicuous greenish flowers render it difficult of detection by the ordinary observer, and it may be more common than is supposed. As here shown, it is larger than natural size.

Bloodroot, *Sanguinaria canadensis,* ranges widely in our eastern States, and is known and beloved by many thousands when, in March or early April, the bareness of the leafless woods cries out for relief. Then the pure white blossoms of bloodroot are rivals of arbutus and hepatica in bringing balm to eyes that are anxious for assurance that spring is on the way.

Who has not seen, in late April or early May, a field that in the distance seems white, but which takes on a bluish tinge when one gets near. When boys, our idea of a hopeless task was to be condemned to count the individual bluets in a large field. But it is better to forget that there are so many and to enjoy the dainty flowers individually and collectively.

Rue anemone, *Syndesmon thalictroides,* with its white or slightly pinkish flowers, arises from its tuberous roots in early spring to help its cousins beautify the still-leafless woods. Most people call the plant anemone, but the leaves, which resemble those of the meadow-rue through whose hollow stems we all drank as boys, easily distinguish the plant from all true anemones.

With the arbutus, and others of that lovely clan that bring joy to those who walk the spring woods, comes the hepatica, *Hepatica americana* (lower left). From the clump of dark green three-lobed leaves, usually reddish-purple beneath, come the fuzzy stems that bear the delicate white or bluish blossoms.

Wild ginger, *Asarum canadense,* is a plant of early spring, but the flower is usually so well hidden beneath the lush growth of leaves that few find it. Its blooms are fertilized by the early flies that find shelter from cold winds on the forest floor, and so well do these visitors serve it that many young plants are assured.

The Cottontail Rabbit in Maryland

By W. BRYANT TYRRELL

In the northern States, where secure briery retreats are rare, and the snow lies deep in winter, most cottontails spend much of the daylight hours in a burrow in the ground, usually one made originally by a woodchuck. Those of our Middle States, where the winters are mild, however, seldom use a burrow.

Everywhere cottontails spend a part of their daylight hours in a bed (or form), especially when the ground is bare, usually in the shelter of a thick tuft of grass, or in a brush pile. Here the animal remains quiet, but enough awake to sense the approach of any enemy, and, if this does not come dangerously near, bunny will sit tight, relying on its camouflage. If once forced to flight from a bed the occupant usually abandons it.

When the young are born they are naked like most mammals, and their eyes are closed. The mother places them in a nest, a cavity in the ground scarcely larger than a teacup, which she lines with fur plucked from her body. The nest here shown was in a hay-field near Laurel, Maryland, but sometimes they are in a fence corner, or in the woods. These young were at least three weeks old, for their eyes had opened.

When the nest was disturbed four of the five little bunnies scattered, only one remaining in the soft fur-lined nest. It was with some difficulty and after considerable search, that they were all found and replaced, and even then it was difficult to keep them still.

Young wild rabbits are extremely difficult to raise in captivity, and it was with some hesitation that I took two of the little fellows home. At first they lived in my camera case by the side of my study table and were fed warm milk with an eye dropper at frequent intervals; when they took to eating a little grass they were put in a small cage on the back porch; and when they became accustomed to their surroundings and their keeper, they occupied a larger cage, where they lived for nearly two months. Then we took them out on the lawn and, after photographing them, gave them their liberty.

Birds as a class have more young at a time than human beings, among whom quintuplets, for example, are so rare as to gain world-wide attention. Still, some birds, as murres and some petrels and other water birds, normally lay only one egg. Hummingbirds, and whippoorwills and their relatives stop with two eggs. Many common birds, large and small, may lay from three to five or six. The shore birds have four. Small birds that frequently lay more than six eggs include the chickadees, kinglets, and bush-tits; some rails, and bobwhites, have a dozen or more.

The series here shown, though arranged in numerical order, have been picked because of their appeal as young birds rather than as representing full broods. First is a young least flycatcher only a couple of weeks out of the egg and the last of the brood to leave, apparently taking a parting look at his home. Photograph by James

A. Galbraith of Minneapolis, Minnesota.

These two young barn owls, which are already almost indistinguishable from their parents, show by their posture and facial expression why they are called monkey-faced. Photographs of this and the succeeding four subjects by Maurice E. Kimmel, Duquoin, Illinois.

The crow triplets, not quite ready to face the world alone, seem to be singing for their supper, rather than for entertainment. These four youthful mocking birds destined, let us hope, to be enrolled among the "future songsters of America", are plainly not old enough, or wise enough, to get their own living. Perhaps big brother, at the right, is voicing the fear that he may be expected to.

Even less mature than the baby mockers, there is little about these bluejay babies to identify them as the offspring of that wise and alert freebooter that flaunts his gay combination of blue, white and black, with the black collar and jaunty crest, as he loudly proclaims his name.

Here are the six children of the logger-head shrike sitting in the sun on a branch of the home tree. These are precocious youngsters, for they already bear the family insignia of their clan, the black stripe through the eye, which is the mark of all good shrikes.

HOODED SKUNK

The hooded skunk, *Mephitis macroura,* lives mainly in northern Mexico, but ranges into the United States in the lower warmer valleys. It belongs to a group whose members are more slender than the other large skunks and are correspondingly agile.

In the color of the back and sides these skunks exhibit a wide variation. In some, like those here shown, the back is mainly or entirely white, but others in the same locality may have little or no white except some on the tail and on each side.

Like all skunks, this species seems generally to be beneficial. The stomachs of those taken in mild weather usually contain insects, principally those to be obtained by digging. In settled areas these animals show a preference for fields and trails in the lower valleys. Here their tracks show that their methods of foraging are similar to those of our eastern skunks, an intensive search of nooks and corners, where numerous shallow diggings indicate that ground-inhabiting insects, including beetles, have been detected and unearthed.

These pictures were taken by Laurence Huey in the valley of the Colorado a few miles north of Old Fort Yuma, Arizona, but on the California side of the river. The animal shown in the circle became so used to being flash-lighted that he failed to react to the flash by elevating his tail. Mr. Huey states that this is the only skunk he ever photographed at night that became so fearless that he could keep his tail down at this exciting moment.

★ Conservation ★

A part of Nature Magazine each month is devoted to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.

★

HISTORY REPEATS

It is amusing to note the startling resemblance between the attitudes and tactics of the outdoor advertising industry today and those by the use of which the brewers and distillers brought about prohibition. The most recent evidence of this lack of vision and limited brain power finds form in a booklet entitled *100 Reformers vs. 25,000 Wage Earners.* It is published by the Outdoor Advertising Association of New York. Actually, however, those hoping to find some effective way of mitigating the situation created by the rural billboard should welcome this publication. It is an inverse contribution making more billboard enemies by its very falsity and extravagance of attack.

In this booklet people who feel that they are entitled to decency, good taste and safety along the highways they have bought at such cost are described as "reformers", "the noisy minority", "dictators" and such. Highway officials, landscape architects, lawyers, doctors, editors, garden club members, women's club members, civic leaders and an increasing host of "just plain folks" will be surprised to discover what they are. Such epithets are coined by small minds; by those straggling far behind the procession in the steady march toward a proper appreciation of values.

According to the title of the booklet, the selfish interest of these "100 reformers" is arrayed against the bread and butter interest of 25,000 wage earners. Setting aside the fact that the 1935 census listed 5324 people employed in outdoor advertising in the United States, no individual or group is seeking to eliminate a single one of these jobs. The fight is not against outdoor advertising but against abuses by outdoor advertising, particularly on the rural countryside. Also, all of this is not perpetrated by the organized industry that comprises the large companies, but a large and officious proportion of it most certainly is.

This entertaining booklet, of course, credits the outdoor advertising industry with providing important income to landowners, a vastly overrated fact so far as rural property owners are concerned. It vehemently denies that the billboards do or can constitute a traffic hazard, despite the testimony of authorities or the findings of courts. Of course, if the billboards didn't attract attention the space couldn't be sold, and attraction of attention is certainly distraction.

Finally, the booklet makes an interesting offer. It says that "the Outdoor Advertising Association of New York will pay $100 to any person who can *prove* that any advertising structure of any member of the Association, which in the judgment of any *fair-minded committee* constitutes an offense against the code of ethics of the Association, if the same be not corrected *within a reasonable time* following the report of such violation." The italics are ours and their inference obvious even though the grammar is not. Of course, it would be impossible to prove to any member of the Association that his sign is offensive; no committee that said a sign *was* offensive would be regarded as "fair-minded"; and "reasonable time" takes in a lot of territory.

We had a personal experience with a reasonable protest about a specific sign. We belonged, some years ago, to a golf club fifteen miles out in the country from Washington. The region is distinctly rural. From the club house lawn, looking across a long expanse of fairways, all was green or thick woods—except a large painted board of the General Outdoor Advertising Company. It bore the garish red message of Esso, one of the most ubiquitous of the advertisers on the rural highway. It was a blemish by day and a blot by night, because, placed on a curve, it was illuminated by the lights of every north-bound automobile.

At that time we were being waited upon frequently by representatives of the outdoor advertising business who felt that we were not being nice in the things we said about them. We called attention to this sign, and to the fact that it was offensive to the members of the club. The gentleman said he would look into it. On his next call he said that he had investigated and could understand that we

might conceivably feel that the sign was badly placed. He followed with the generous offer to move the sign if we would find him another site that he could lease. Negotiating leases for the General Outdoor Advertising Company being rather out of our line, we were forced to leave the matter to the billboard representative's own good judgment and willingness to avoid offense, not to mention his allegiance to his company's code of ethics. The board is still on the same spot.

There are many more glaring examples of dangerously-placed, scenically-destructive and otherwise offensive signs. They may be seen on any motor trip into the rural regions. A few of these are pictured in the issue of the *American Nature Association Quarterly Bulletin* for April, 1939. These pictures, together with the text, provide ample proof of the obsolete significance of the "code of ethics" of the organized outdoor advertising industry. This issue of the *Bulletin* is devoted to a report of current conditions in New England. We submit it (and copies are available on request) as a fair and unassailable answer to the ignorant and intemperate booklet of the Outdoor Advertising Association of New York.

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CONSERVATION IN RELIEF PROJECTS

During the past several years there are few sections in the United States that have not seen the operations of large numbers of young men engaged on some relief project. Many of these involve "outdoor rehabilitation", "landscape development", "habitat improvement", or work of similar import. Some represent real conservation; many are destructive. Because of the wide-spread publicity that has heralded those accomplishments of real merit, there has grown up a tendency on the part of the press and the public to regard any outdoor activity by camps of young men on relief as "conservation". In fact, this word is becoming widely misused, and misunderstood.

The possibility that harm rather than improvement would result from these efforts was early realized, and elaborate plans were made whereby all outdoor activities would be formulated and supervised by men from the scientific branches of the Federal government whose training fitted them for such work. The headlong development of the work, however, and the necessity of drawing supervisors as well as workers from the ranks of the unemployed, nullified in large part these good intentions, and there has resulted a vast amount of harm, much of it irretrievable.

Frequently such cases are recognized, and criticisms are voiced by interested citizens. Only rarely, however, do we find such criticisms, with definite examples, published in scientific periodicals, or in the reports of organizations devoted to fostering esthetic appreciation of the outdoors.

Even the vicinity of the Capital City, from which all these outdoor relief activities are directed, is not free from examples of misdirected effort. In "Nature At Washington", published in *The Living Wilderness,* December, 1937, after recounting several instances of the destruction of beauty spots resulting from private indifference and vandalism, John Collier, Commissioner of Indian affairs, has this to say:

> Once I had said, watching this swift and always speeding-up ruin of Washington's greatest attraction—the abundant nearby wildwood and even wilderness country—I had said, "the remedy is public ownership, park extension".
>
> I said it once. Before the costly slaughter of the Mall had gone to its unbelievable end. Before I had learned what it was that was going to be done to the Potomac wilderness area. Before I had watched the wrecking, this past winter, of the Nelly Custis homestead area, that perfect little wild glen with its trees cut down, its hollows dragged to a level by the steam shovel. But having been since youth and by inheritance one in whose mind "public ownership of natural resources" was an omnipotent phrase, still I might have cherished a hope for the Washington environs except that I had to observe—and every day I have to observe—the obscene mutilation of that once-exquisite wilderness-island so close to the Memorial Bridge, so close to Georgetown. I have to acknowledge that for wildwood, or thousand-year-old wild-plantation, primeval-haunted island, to be made into park property is more certainly, more swiftly to doom the wilderness, to doom beauty, to doom delight, than would be the leaving of the condemned forest or island to depraved private ownership.

Wise and honest John Collier was referring to the "improvement" of Analostan Island, a fragrant cut from the Piedmont Plateau by the Potomac in past ages, now ravaged for several years by a relief crew, the ruins of its old historic mansion obliterated, and even its gentle and interesting box-turtles destroyed, cleft by the "relief" axes of ignorant and unrestrained youths.

But, of course, mismanagement leading to destruction is not peculiar to any particular locality. Read this from the pen of M. L. Fernald, Director of the Gray Herbarium at Harvard University, in an article urging better protection of our native flora, published in the *Journal of the Franklin Institute*, September, 1938:

> On the last day of March of this year the papers in Massachusetts contained an invitation for citizens to visit the forests denuded and altered through wholesale effort, unfortunately misbranded "conservation". I quote from the *Boston Transcript* of March 31: "The camps that have had 65,000 boys . . . at work . . . ought to be worth a visit. . . . These boys have sent $14,000,000 to their homes . . . besides the money reserved by them for their own personal use. They have done a good job, for I am told that the CCC has advanced conservation eighty years . . . there will be boys on duty at the barracks to receive the public and to show visitors through the forests to see new ponds, roads, bridges, beaches, waterholes and new plantings."
>
> Now think carefully for a moment. The building of artificial ponds, roads, artificial bridges, and artificial beaches and the planting of introduced trees and shrubs is not conservation. It is just the opposite of true conservation, for it upsets the natural equilibrium which had become established long before man, proud of a supposed resemblance to God, came to ruin it. True conservation leaves Nature, mother of us all, uninjured and the true conservationist is a lover and defender of uninjured Nature. According to the quoted report, misguided but loyal and enthusiastic young men had been paid in a single state more than $14,000,000 of the taxpayer's money for making the face of Nature unnatural. . . .
>
> If vast regiments of otherwise unemployed young men are to be encouraged to hew, rake and alter the forests, they will unconsciously become destroyers of the natural equilibrium of Nature.

(Continued on page 279)

THE TRUTH ABOUT KEA

New Zealand's famous parrot is not the sheep-killer it is claimed

By SYDNEY PORTER

THOUSANDS of feet above sea-level, on the highest ranges of the Southern Alps of New Zealand, amid scenes of unparalleled splendor, where the glittering snow-capped peaks of New Zealand's highest mountains pierce the celestial blue of the southern skies, in regions of eternal snow and ice, where the great blue-green glaciers roll almost imperceptibly down from the highest peaks, at the very limit of the stunted alpine growth, we find that strangest of strange birds, the kea, to my mind the most fascinating and peculiar bird I have ever come across.

For centuries this highly aberrant parrot fought the elements and finally won its battle, becoming perfectly adapted to its environment. Then man came to its mountain fastness, and the kea found an enemy against which the odds against survival seemed a million to one. Whether the kea will become extinct is a matter of much speculation on the part of naturalists. Some say that owing to the inaccessibility of its haunts it will never be shot out, but there are few spots now in the South Island of New Zealand where the sheep farmers have not penetrated, and to the average sheep farmer the kea is what a red rag is to a bull. Other observers state that the kea will linger on only in the places where it is protected.

Everything is being done to foster the idea that the kea feeds on mutton. Children in schools are taught about a horrible, rapacious bird that feeds on the kidneys of living sheep. People who should know better have cases set up in museums with half a dozen keas in the act of devouring the carcass of a lamb heavily daubed with crimson paint. Every time we see a kea pictured in a scientific book, in the background there are usually two of these "monsters" in the act of tearing out the kidneys of a sheep. To my mind it would be just as incongruous to represent human beings, every time they were pictured, to be feasting on a mutton chop, and humans are far more logically to be shown eating sheep than these parrots.

I have still to be convinced that this bird kills sheep. No one I ever met has ever seen a kea kill a sheep. With the tales of sheep-killing it is always the old story of someone who knew someone else whose friend had seen them. No bird in the world is more malignantly libelled than the kea, and usually by people who know nothing whatever about it.

It is hard to imagine a bird, belonging to a family whose members are confined solely to the tropics, being able to sustain itself in such inhospitable regions, especially in the winter time. Even in the summer bitter winds and furious blizzards roar up the alpine valleys where the kea makes its home. For days at a time torrential rains beat down, and the valleys fill up with drifting clouds and mists. Sometimes the winds are so strong that it is impossible to stand upright.

KEA IN THE WASHINGTON ZOO

In his native country the kea was long persecuted for alleged killing of sheep. Actually he is an interesting bird apparently innocent of this charge

Not only does this bird manage to maintain itself, but it is able to "do itself very well", as they say in Yorkshire. With a specially adapted beak it digs amongst the alpine vegetation for succulent roots, or feeds on the berries of the dwarfed trees. Most of the droppings I examined contained the seeds of various alpine plants. As these were intact the bird must act as the distributing agent for many of the berry-bearing shrubs of those regions. I have often seen them pull out quite large stones from the hillsides, obviously looking for grubs or insects of some sort.

Keas are fascinating birds to watch. Their chief trait is unbounded curiosity. Sit down quietly, especially in the evening, and you are soon surrounded by an inquisitive crowd. They never seem to alight near but, with a kind of a hop, skip and a jump, gradually get closer and closer until at last you are surrounded on every side by throngs of quietly speculating birds. They watch every action and examine every article left lying about. At first the birds touch each object gingerly with the tip of their beak; then they feel it with their tongue. When, at last, they feel that it is safe, and desirable, it is dragged away.

The fascination of the kea lies in the fact that it has such a human-like element in its nature. If their persecutors only knew them as intimately as I do, they would not have the heart to massacre them.

Thanks to the untiring efforts of the New Zealand Native Bird Protection Society and a few other enlightened people, the Government bounty had been progressively

cut from seven shillings to nothing. This was not for love of the kea. The argument used was: Why should the taxpayer have to pay for ridding the sheep farms of birds? Why should a man buy a farm overrun with keas and the taxpayer be asked to pay for the clearance and give him a good income in the bargain? Why did not the Government pay for rats, mice, etc.? There was a publicity campaign. The fate of the kea didn't matter a little bit. Its defenders could have pleaded forever for the bird, but when the money question came up, that was a totally different matter!

When the bounty was being paid many shepherds supplemented their earnings by shooting the birds. It is little wonder that these men, and also farmers, were anxious to keep alive the rumor about the kea's sheep-eating propensities.

Travellers come into the alpine regions where the bird is found, ask a few questions about it, usually never seeing the birds at all, and then write a book. The two following are extracts from this type of book: "These most destructive creatures are found in great numbers at the foot of snow mountains and kill the sheep by fastening their strong claws to the wool while they tear the flesh and eat out the livers," and again: "The kea has a strange history. Once it lived on berries and grubs but years ago it became fond of mutton, and according to widely credited accounts it is very destructive to sheep. Alighting on the back of a sheep, the kea fixes its claws in the wool or flesh and quickly makes an opening with its two-inch beak." And so the lies grow. This kind of bosh is usually written by people who know nothing whatsoever about the habits of this bird, but who jump at any bit of sensationalism to enliven the otherwise dull pages of their literary products.

ON A STAMP

New Zealand has recognized the kea on its shilling stamp as though in regret for its persecution

Although terrestrial, the kea is also a bird of the air, spending almost as much of its time in that element as upon the ground. It is a wonderful sight to see a flock of these birds wheeling in the intense sunshine in the rarefied atmosphere of the great ice peaks. They are transformed from the dull greenish birds seen in captivity or in museums. In flight we see the bright yellow-spotted flight and tail feathers and the beautiful bright orange underwing coverts. In its proper setting the kea is a beautiful bird, often the only splash of color in the sombre, desolate and stony valleys.

The call of the kea is somewhat between the mewing of a seagull and the yelp of a dog. Sometimes, also, the birds will make a call like that of a cat; at other times there is a strangely human sound in the calls. They are noisy birds, especially when on the wing and up in their mountain home. When in the air the tips of the primary flight feathers are separated and upturned like those of an eagle; in fact the bird looks hawk-like and this, no doubt, lends color to the fantastic sheep-eating tales.

Around the Ball Hut by the Tasman Glacier on Mount Cook the keas are fairly numerous. They are protected by the authorities at the Hermitage, the hostel at Mount Cook. But there are even people, including certain members of Parliament, who are using every effort to get them destroyed, and yet never in the history of the Hermitage has a kea been known to touch a sheep, and keas and the many sheep there live on friendly terms.

The sexes are easy to distinguish. The male bird appears to have the cere and the skin around the eye yellow, while in the female it is black. The lower mandible in the male is also a much brighter yellow; he also has a much lighter-colored cap. I have never seen this way of sexing the kea mentioned. I thought at first that the dark-colored birds might be the young ones, but there are several in the Wellington Zoo that have been there for a considerable time and the skin still remains dark.

Like many other New Zealand birds this parrot is semi-nocturnal, and can be heard flying around long after the night has fallen. It can also be heard before the dawn in the morning. With the four birds that I brought back to England, I found that most of the feeding was done at night. They roost in crevices in the rocks, under overhanging boulders or beneath the thick, matted alpine bushes.

The keas nest in deep holes in the rock, usually in places utterly inaccessible to human beings. This is one thing that has been to a large extent their salvation.

The guide residing at the rest hut by the Tasman Glacier told me that the keas have a habit of flying up on the central ridge of the roof with small stones and then letting them roll down the corrugated iron, apparently being amused by the noise.

It is said that the bird is called the kea after its cry and it does not need a great stretch of imagination to pick out the particular cry which resembles a long-drawn-out "Ke-ah."

Cold does not seem to affect them much, for I have seen them sit for lengthy periods on the ice crags of the glaciers. They do not seem to mind the extreme coldness to their feet; in fact they seem to enjoy it.

The birds seem to feed to a certain extent on the juicy roots of a certain mountain tussock grass. I noticed that they always pulled the sections out of the middle of the clump, never at the sides; after the edible portion was chewed off, the fibrous part would be rejected. In captivity the birds feed mainly on roots, such as carrots. They are also fond of biscuits; they seem to take very little seed of any sort, although the ones at the Wellington Zoo seem to be fed solely on dry maize. I think mealworms would be beneficial in lieu of the grubs that they get in the wild state. The kea makes one of the most delightful pets that it is possible to imagine and in my opinion ranks second to

none in intelligence among the wide-flung bird tribe.

The kea stands for something so essentially primitive New Zealand; not the New Zealand of today, but that land of strange anomalies where unique vegetation and strange bird life reigned supreme. Like all the other natural products of that country, it does not fit in with the scheme of things now. Barren hillsides, destitute of the alpine vegetation, barbed wire fences, and corrugated iron sheds are no proper setting for the kea. The sheep farmers have extended their domains right up to the snow line and all the alpine flora has been burnt off; no spot where a sheep might get a mouthful of grass has been spared.

The farmers in those regions, being true Britishers, had to kill something, and in the days before the introduction of the chamois and the tahr the only living things were the sheep and the keas, so the kea had to pay the price. As he was not on the list of conventional sporting birds, an excuse had to be made for massacring this good-natured and inquisitive bird, so they said that he ate the sheep. To make this worse they said he ate the kidneys from living sheep. These stories are very much on a par with the stories told in the English countryside of night-jars sucking goats' milk, of eagles carrying off children, and of cuckoos changing into hawks on the approach of winter. Also, it is quite easy for a person to see keas examining a dead sheep, for they are exceedingly inquisitive birds, and this helped the rumor to grow and grow, until it was seized upon as a commercial proposition.

An example of the way this bird has gotten a bad name is an article written some time ago. After a long discourse on the blood-thirsty habits of this bird, absolute and conclusive proof was brought forward—a photograph of a kea with a huge lump of mutton just torn from the living sheep. It was entitled "Guilty." What evidence was there to be brought forward to dispute this? The photographer's trump card, "a camera cannot lie". No, but sometimes photographers do! It doubtless had convinced some people, but it didn't quite convince me, for the kea was stuffed, and badly stuffed at that!

The journalist would possibly get five pounds for his article and a unique photograph, and the case against the bird was again strengthened. So, after all, the kea is a good commercial proposition for some people. This reminds me of a little story I heard from a one-time gold prospector. A few years ago, when seeking the precious metal in the most southerly part of New Zealand, he came across a professional kea hunter, where there were no sheep or likely to be any. He told the prospector that he was not such a fool as to spend his time seeking metal so hard to find, as the kea heads proved a veritable gold mine for him.

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Unusual Redstart Nest

By CORDELIA J. STANWOOD

LAST summer a friend who had a motion picture camera desired a redstart nest for a study. While searching for a subject, I came upon a beautiful one in a fir. The typical nest of the American redstart in this part of Maine is commonly built in a gray or white birch. I have found them also in a maple, an alder, and a yellow birch, but nests in such trees are rare, since the bird seems to require a number of branches ascending at an acute angle to the trunk to give the correct space in which to model her vase-like structure. But here was a nest in an evergreen with branches far apart and extending from the stem of the tree at almost a right angle. It was only when I flushed the brooding bird from the nest that I was convinced that a redstart had built it. The bird started the foundation on two widely diverging twigs, then, using that beginning as a point of attachment to which to anchor her building materials, erected her nest on two other widely-spaced branches. The nest, really, was supported but slightly by the tree stem and two twigs. The common nest of the redstart is deeply grooved by the ascending branches that form the vertical crotch. It was as if this particular bird was so imbued with the spirit of nest-building that she could almost have woven a nest in mid-air if no tree were handy.

Things to Think About

Agreement has at last been reached on a mutually satisfactory purchase price for the 7200 acre Carl Inn Tract of giant sugar pines to be added to Yosemite National Park. Situated on the western boundary of the Park, this tract includes one of the finest stands of these trees. In July, 1937, Congress approved acquisition of the area, and the purchase price of $1,498,500 has been accepted.

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Robert Moses, New York City Park Commissioner, has appealed to stockholders in outdoor advertising companies to safeguard their investments by demanding that the operating heads of the companies recognize the growing opposition to billboards placed in defiance of the public interest. He warns that the companies "cannot successfully flout public opinion, which in the long run will prevail. All that your industry can do, if it continues to be badly advised on public relations, is for a very short time to postpone regulation, in which case the pendulum will swing just so much farther and in the end, instead of reasonable control of your industry, there will be something close to complete prohibition."

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In order to further study of the life habits and migrations of hawks and owls extensive banding is necessary. To this end Richard H. Pough, National Association of Audubon Societies, 1006 Fifth Avenue, New York City, has available bands for this work. They cannot be issued to anyone under sixteen years, but full details of how bird students may cooperate in this important work may be obtained from Mr. Pough.

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The question of opening the season on quail in Ohio has been a perennial issue ever since Bobwhite was placed on the song bird list in that State. This year a bill filed for a general open season was withdrawn after farmer groups declared that they would close their lands to any kinds of hunting if the shooting of quail was authorized. The Cincinnati *Times-Star* points out editorially that there are two good reasons why restoration of quail to the game list has been fought. "One is," says the paper, "a genuine fear, not only among bird lovers but among sportsmen as well, that a statewide open season would seriously decimate the state's quail population. Another is the farmer's innate dislike of trespassing hunters, too many of whom show an amazing inability to distinguish between game and his livestock." An attempt is now being made to meet the issue by permitting quail shooting on specially designated management areas when the Department of Conservation determines that a "surplus" exists. The State would post and protect the areas and reserve the right to check over-shooting.

• • •

Beaver protection in Oregon has proved successful to the point that in some regions there is an over-population. Using Federal aid funds for the purpose, excess animals will be live-trapped and moved to desirable areas not now supporting beaver. The beaver's cooperation in insuring stream stability, improving and extending fish habitat and helping to check flood and erosion conditions is being eagerly sought.

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In his recently published book, *Old Williamsburg and Her Neighbors*, William Oliver Stevens describes that section of U. S. Route 1 that runs from Fredericksburg to Richmond, Virginia, in interesting words. He says:

"Much of the way the eye is offended by a monstrous eruption of barbecues and hot dog stands, and particularly by a noisome pestilence of road advertisements. I wish no harm to the fraternity of outdoor advertising, of course. I merely hope that they will boil in oil for a thousand years for the sins they have committed against the American landscape."

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Students of game management will find much of interest in the publication of the majority of the papers delivered at the two Idaho game management conferences held under the sponsorship of the School of Forestry of the University of Idaho in 1937 and 1938. These have been published as Bulletin No. 8 of the School of Forestry at Moscow, Idaho.

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Preservation of not only the buildings but the industries and domestic arts of the pioneers is planned in Great Smoky Mountain National Park. Since much of the area now included in the Park had been settled to some degree, homes carved out of the wilderness had been built and were the center of the livelihood of the people. Acquisition of these areas for park purposes resulted in the emigration of the inhabitants, but in order to record the earlier conditions typical houses are to be preserved.

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Under the provisions of H. R. 3648, introduced in the House of Representatives by Congressman DeRouen, the President, upon recommendation of the Secretary of the Interior, would be empowered to proclaim tracts of land within National Parks and National monuments as wilderness areas. Such tracts would be protected against hotels, permanent camps, highways, roads, truck trails and other similar physical improvements. In the event of the passage of this measure it is to be hoped that the Secretary of the Interior will immediately ask the establishment of substantial areas as wilderness. However, it is our opinion that a proper appreciation of the objectives of our National Parks and a policy of preservation would make such legislative provisions unnecessary.

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Some 20,500 head of elk are now to be found in the

National Forests of Colorado, representing an increase of 455 per cent since 1914, according to an announcement by the Division of Wildlife and Range Management of the regional office of the U. S. Forest Service. The increase has been steady despite open seasons each year since 1929. Today elk are found in all of the fourteen National Forests, including those in which all of the original stock had been killed. Animals from northern Wyoming herds were introduced to replenish the stock and have increased through protection and control of kill.

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Ignoring the vital importance of control of any species of wildlife on the basis of scientific knowledge and not old wives' tales, bounty laws and private control measures are constantly appearing. One of the more recent of these is the proposal for a bounty on buzzards in Texas. The claim is made that buzzards spread disease, although scientific authority denies this. Opposing this measure, the Texas Nature Federation points out that "the control of any native species of animal should not be undertaken until trained biologists have studied every aspect of the case and are convinced that such control is necessary, and when this has been done the control measures themselves should be conducted only by properly qualified authorities."

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Placing of the pelican, roadrunner and woodpeckers on the protected list in Texas is being actively urged by the Texas Nature Federation. All three of these birds are now shot due to misunderstanding of their life habits and value, it is pointed out. Picturesque and typical species of the region, the pelicans are persecuted on the ground that they are injurious to the interests of commercial fishermen, when, as a matter of fact, analysis shows that they feed on fish species of little or no commercial value. The roadrunner is persecuted on the ground that it destroys quail eggs, when, in fact, less than two per cent of the diet of this bird can be proved to come from this source. Conversely, the roadrunner is an important bird in control of insect and rodent pests. The only charges against the woodpeckers are on the grounds that they drill holes in homes and utility poles. The damage thus caused is infinitesimal compared with the tremendous help given by these birds in controlling insects.

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CONSERVATION IN RELIEF PROJECTS

(Continued from page 274)

Put them to work destroying . . . the Japanese honeysuckle. So long as it is kept in restraint this Asiatic migrant is a handsome vine; but it has invaded the Southeast like a horde of Huns. Every where from the Gulf States to Long Island this rampant and unrestrained twiner is strangling the native vegetation. It has become what I have elsewhere called the Yellow Peril of the South. Its destruction would be a notable achievement. Its continued toleration is a menace to the native plants and animals.

An example of mismanagement perhaps more serious in its immediate potentialities is published by William P. Wharton, Chairman of the National Conference on Dutch Elm Disease Eradication, in *American Forests* for December, 1938. It is based on the report by J. H. Faull and J. C. Boyce, professors of Forest Pathology at Harvard and Yale Universities, of a joint field study of the eradication campaign. According to these authorities, the most serious obstacle to the successful progress of eradication work is the policy of the Federal Government of attempting to deal with the emergency too largely with WPA labor. It would seem that the comments of these able botanists, backed by the personal experience of Mr. Wharton, deserve the attention of legislators.

Mr. Wharton quotes from the report:

"It is our belief that unless radical changes are made this year in the methods employed and in the system of financing the work, the battle for eradication will be lost. . . . The federal organization is now based on a small and efficient personnel on a year-long basis, but the vast majority of the workers, even for the exacting work of examination of the trees, which requires physically agile labor of more than average intelligence, must be obtained from the relief rolls through the WPA. (Nearly ninety per cent of all expenditures has come from WPA allotments.) Only a small number of men from the relief rolls are qualified for this work, no matter how much training is given them, and the number is steadily declining, while the number of men who never can do such work satisfactorily increases. They are mostly city men unused to the woods.

"Furthermore, the relief roll workers are so hedged with restrictions, as to the number of work hours per month and the fact that they cannot be employed except in the vicinity of the locality from which they are registered on the relief rolls, that even the satisfactory men among them cannot be used to full efficiency.

"If it were not so tragic, it would be absurd, that during the most critical period for operations against the disease, the field personnel and equipment must remain inactive for periods of several days to a week or more, and this condition has prevailed practically every year since the work was started. Systematic scouting should begin in May, but this year [1938] it was not started until July 9th. June is the most effective period for this work. This irregularity and uncertainty utterly demoralizes the field forces." . . .

Mr. Wharton himself continues:

Most important of these recommendations is that the government provide funds other than WPA that will permit the uninterrupted and flexible employment of men qualified by training, expertness and physical ability to perform the key tasks of eradication. These are scouting, climbing, sampling, and field supervision. WPA labor can help but it should be confined to what is called clean-up work.

The foregoing is not a criticism of the Works Progress Administration. That agency deserves great credit for its interest, cooperation and liberality of funds. Its own officers recognize the defects and handicaps of WPA labor when applied to work calling for unfailing continuity and for special ability. This recommendation, therefore, is common sense recognition after several years of experience that reliance upon WPA labor to do the technical work of eradication is a suicidal policy for the elms and an unwarranted hazard to the public investment already made in this work. Certainly with a few more seasons such as the one just ended, the fight to eradicate the Dutch elm disease will be lost.

This is a serious situation—the most critical since the disease invaded our land. It calls for the government and the states to act, and act promptly, to realign and reorganize the battle lines. And it calls for citizens everywhere to demand that this be done *before it is too late.*

Waltonians Fight Pollution

Annual convention finds League alive to conservation problems and need of pure-streams law with "teeth"

By RICHARD W. WESTWOOD

CONDEMNING industrial polluters of streams and bureaucratic apologists for pollution, members of the Izaak Walton League of America, at their annual convention in Chicago, dedicated themselves anew to an unrelenting fight for a pure-streams law equipped with means of enforcement. They called upon all friends of conservation to support S. 1691, by Senator Bennett Champ Clark of Missouri, and H. R. 4170, by Representative Karl Mundt of South Dakota, and to demand the rejection of all other bills masquerading as pollution control but actually designed to protect polluters from effective regulation.

The menace to humans and to natural resources through pollution of our streams is one of the vital and fundamental issues confronting Americans today. Every citizen should be informed on this subject.

Complete discussion of the question is to be found in the *American Nature Association Quarterly Bulletin*, Vol. 2, No. 1. Copies are available on request.

Other Bulletins available are:

Vol. 1, No. 1—A Statement of Conservation Policy.

Vol. 1, No. 2—Highway Zoning in California.

Vol. 1, No. 3—A Study of Conservation Education.

Vol. 2, No. 2—Roadside Control in New England.

While pollution was actively discussed on the floor of the convention, and in the corridors, delegates also turned their attention to other important conservation questions. Otto C. Doering, president of the League, reported the largest membership enrollment in recent years. Kenneth A. Reid, League general manager, cited the increasing activity of the chapters in local, state and national conservation work.

It was evident from his talk that wildlife has a staunch friend in Richard H. Rutledge, new director of the Division of Grazing of the United States Department of the Interior. He pointed out that the quesion of restoring the range, and at the same time keeping the livestock industry alive, is one of the last public land administration problems to be taken up. In this, he said, wildlife has its important part, as evidenced by the inclusion of conservationists on the boards of the grazing districts, and the setting aside of some four million acres for refuges. In meeting the problem of use of the remaining public lands for grazing, Mr. Rutledge urged "a cooperative basis founded on the facts of the situation and not on prejudice, politics or propaganda."

Dr. Rudolf Bennitt of the University of Missouri discussed ecology in its relation to wildlife management, presenting several points of interest to those concerned with the conservation and increase of game species. He urged as fundamental the fact that the annual kill by man, plus the normal loss by Nature, must never be such as to endanger a substantial breeding stock that will survive the winter. As to predators, he declared that these have values, particularly in developing in game species the very gamey qualities desired. He asserted that the killing of predators does not necessarily mean an increase in the numbers of game. He added that a great deal more time, effort and money are being spent on predator control than is warranted. Dr. Bennitt created discussion when he said that while restocking artificially is justified on large areas that have adequate wildlife carrying capacity and have been "shot out", restocking, as such, is of little value in increasing breeding stock on lands now supporting a natural supply of wildlife. Nature, he said, with restraint and commonsense by man, will do a better job of increasing the wild population.

Three interesting and important addresses defy condensation. These were on the problem of saving the Great Lakes fisheries, by Dr. John Van Oosten; on the return of the Atlantic salmon, by S. Barry Locke; and on the effects of dams on aquatic resources, by Dr. Henry Baldwin Ward, president emeritus of the League.

The relation between recreation and conservation provided a subject worthy of forum discussion over the air, where it would reach millions of radio listeners. And the speakers on this subject would be ideal for such a presentation. Carl P. Russell, supervisor of research and information of the National Park Service, discussed the problems of the Service in reconciling the preservation of the National Parks with the recreational demands made upon them. He expressed the conviction that the recreational areas set up through cooperative work in the states will relieve this demand. He declared that the primary objective of the National Park Service with relation to its primeval parks should be the interpretation of natural and human history. He urged that the Service own the facilities in the Parks and thus be able to exercise more effective control over their character and use.

Robert Marshall, chief of the Division of Recreation and Lands of the United States Forest Service, pointed out that recreation is now recognized as an important phase of the multiple use of the National Forests. He said that

public recreation developments in these areas should harmonize with the environment, should be open to the general public and that recreation forms should be appropriate to a forest region.

Aldo Leopold of the University of Wisconsin discussed wilderness areas with relation to recreation, declaring that it is a fallacy to think that because land is idle it is not doing something. "Until we can take pride in the fact that we are part owners in an idle area we can never get anywhere with the wilderness idea," he asserted. He added that we must get over the idea "that recreation must be made easy if it is to be recreation. The booster philosophy and the wilderness idea are incompatible. We cannot vote a wilderness policy into existence; we must earn it."

Among the resolutions adopted by the delegates to the Waltonian convention were several bearing on important conservation issues of national importance. In connection with grazing it was asked that increased recognition be given to "the high public values in wildlife and recreation as land uses" and that grazing be adjusted "in favor of the fullest preservation and development of the public values of watershed protection, wildlife conservation and other recreational uses." Also on grazing, the convention urged conservationists to participate in the work of the district grazing boards, asked amendment of the Taylor Grazing Act "to include the preservation of environmental conditions favorable to wildlife and recreation", and demanded that "grazing uses be definitely restricted to insure the perpetuation of permanent resources of the soil." The appointment of Mr. Rutledge to his present post was particularly commended.

Several resolutions relating to National Parks were adopted. On general policy the League deplored overexploitation, and extension of roads into wilderness areas, and called upon the National Park Service to "reaffirm its allegiance to the old ideals and rededicate itself to the task of guarding for this and future generations a priceless possession." Opposition was recorded to a new entrance to the Yellowstone on the west slope. Support was declared for bills providing for the establishment of wilderness areas in National Parks and Monuments by Presidential proclamation. The League went on record against the bill to establish the John Muir-Kings Canyon National Park because of the exclusion of the canyons of Tehipite and Cedar Grove for reclamation purposes, and because of the continuation of certain private leases within the area, holding that these reservations are not in accord with highest Park standards.

The Izaak Walton League has long been a principal supporter of the Quetico-Superior project, and the convention reaffirmed its support and urged the immediate appropriation of $2,500,000 for the acquisition of privately-owned land within Superior National Forest and especially within the area defined by the Shipstead-Nolan Act authorizing this project. The delegates also went on record against the proposed Grand Portage road that would open up a part of this area.

Recognizing the importance of conservation education, the League urged consideration of the importance of training teachers to teach conservation; of the need of careful preparation of teaching materials by the best available authorities; of the educational value of demonstration conservation projects; of the need of research; of the importance of all possible media of education, including periodicals, films, exhibits and the like.

Other resolutions urged repeal of obsolete land laws; opposed construction of a road to Basswood Lake, Superior National Forest, Minnesota; asked that authority be given to the Army Engineers to control the water chestnut; requested full appropriation of funds derived from excise taxes on arms and ammunition as provided by the Pittman-Robertson Act; urged a Great Lakes fisheries treaty, and asked that steps be taken to establish statutory codes to define public waters and their lawful uses.

Otto C. Doering was reelected president of the Izaak Walton League, and W. D. Cox and Charles L. Horn were continued as secretary and treasurer respectively.

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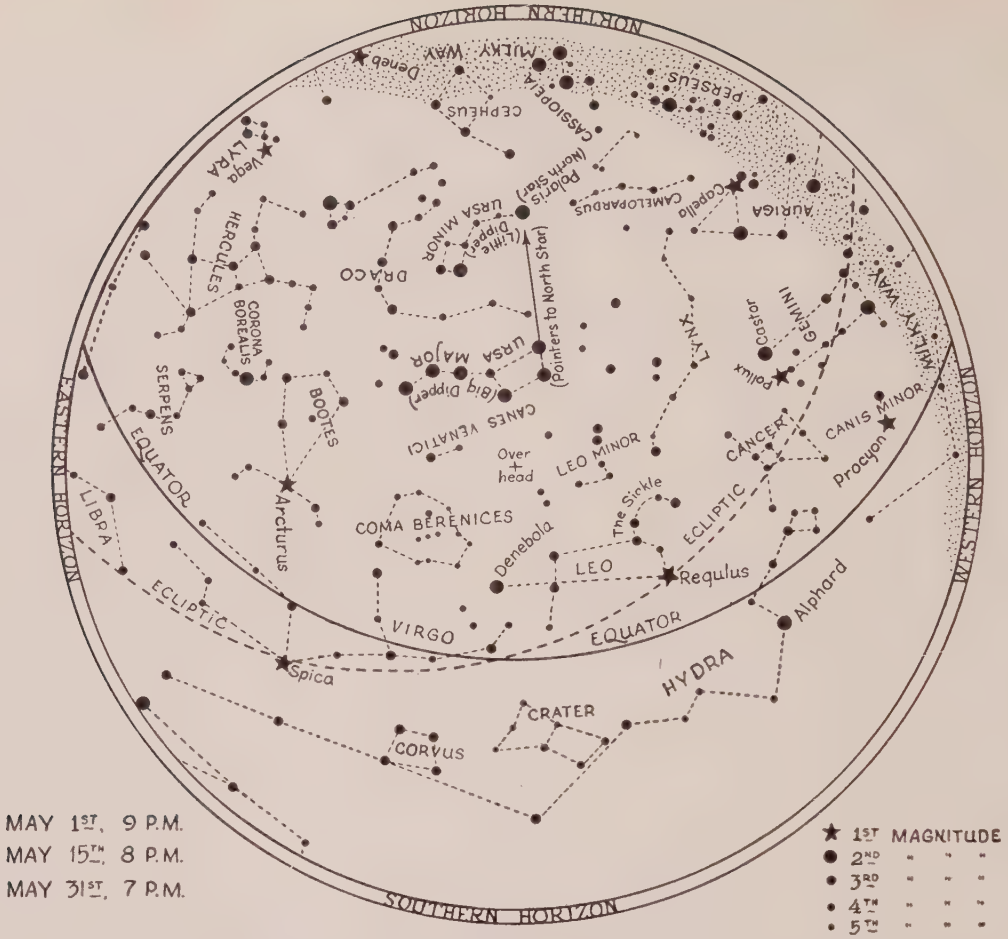
ICEBOUND

By EARL L. BRAY

THE DOE had lain on the ice for two full days. She was about a quarter of a mile from the shore, on Goose Pond, Berkshire County, Massachusetts. It was the first ice of the season and was not safe enough to carry the weight of a man, so rescue was impossible. Finally, when the ice was about an inch and a quarter thick, two fishermen, testing it with an axe, ventured out to the animal, took the picture, and then, placing a rope around its neck, slid it to where it soon made off into the woods. Pleased, as the doe loped away, the rescuers felt that they had done their good deed for the day. So did the doe.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

The Evening Sky in Spring

By ISABEL M. LEWIS

BY THE early part of May most of the brilliant coterie of stars that made our winter evening skies so beautiful have passed beneath the western horizon. A few still linger on, low in the west or northwest. Among these are Procyon, The Lesser Dog Star; Castor and Pollux, The Twins in Gemini; and Capella in Auriga. Betelgeuse, loath to depart, may still be seen in the early evening, its red rays twinkling through the western haze. There is an old legend that says that Orion disappears in the west as Scorpio, The Scorpion, rises in the east, because the giant warrior fears the creature's fatal sting. However that may be, it is certain that the two are never seen above the horizon at the same time.

Procyon, not only farther east than Sirius but also much farther north, may be seen long after Sirius has disappeared from view. Because of its northern position it also rises before Sirius in the fall. Its name, in fact, means "Precursor of the Dog". Capella, whose golden splendor has so often won our admiration on winter evenings, is the last of all the brilliant winter stars to depart, and it also has a rival appearing in the northeast even before it has passed from view below the northwestern horizon. The magnificent sapphire, Vega, which has been called both "the arc-light of the sky" and "the diamond of the sky" —although its name signifies "falling eagle"—is now in view in the northeast.

The three stars, Vega in Lyra, Capella in Auriga, and Arcturus in Boötes, the latter a glorious star of orange hue now high in the east, are nearly equal in brightness, with Vega slightly surpassing Capella, and the yellow star, in turn, a bit brighter than Arcturus. The three are nearly of zero magnitude on the scale of stellar brightness. A star of this brightness is two and a half times brighter than a standard star of first magnitude, such as Aldebaran. Next to Sirius and Canopus, these three stars are the brightest in the heavens. Vega and Arcturus will continue to be visible in the evening sky throughout the spring and summer and into the fall—Vega much longer than Arcturus—and every one should know by sight these two gems of the sky.

The great triangle of the winter sky, whose three vertices were marked by the stars Betelgeuse, Sirius and Procyon, is now replaced in the early evening hours of spring by another huge triangle at whose vertices will be found, respectively, Denebola, a star of second magnitude, at the tip of the tail of Leo, Spica in Virgo, and Arcturus in Boötes.

Spica and Regulus are two stars, white in color, and of the first magnitude in brightness, that are also conspicuous in the evening sky in the spring and early summer. Regulus can always be easily recognized by the fact that it is in the configuration in Leo, well known as "The Sickle", lying at the end of the handle. Regulus has always been the "star royal", and its name is a diminutive of the Latin word *rex*. It was also known as Cor Leonis, Heart of the Lion. Glory, riches and power were, in olden times, supposed to be the lot of all born under its influence. Regulus is one of the nearer stars, at a distance of about sixty light years from the earth, and is a helium-type star. Spica, also a star of similar type, is, however, ten times more brilliant, intrinsically, than Regulus, and a thousand times more brilliant than our own sun. Its distance from the earth is about one hundred light years.

At this time of year the constellation of Hydra, The Water-snake, which has the enormous extent of ninety-five degrees, may be seen entirely above the horizon. Its two riders, Corvus, The Crow, and Crater, The Cup, lie nearly due south. Its head is outlined by a group of six stars, one of the third, a second of three-and-a-half, and the remainder of the fourth and four-and-a-half magnitudes. These stars will be found a few degrees below Cancer, the most inconspicuous of all the zodiacal constellations, which lies between Gemini and Leo, and contains that cluster of stars known as "The Bee-hive Cluster", or "Praesepe", faintly visible on a clear night even without the aid of a telescope. The brightest star in Hydra is the star of second magnitude, known as Alphard, The Solitary One, which may be seen some distance to the southwest of Regulus, and, as its name implies, in an isolated position. From Alphard a long line of faint stars, which includes but four of third magnitude, two or three of fourth, and many of fifth magnitude, outlines the body of this huge celestial figure, which ends at a point south of Libra. It stretches its enormous bulk below the three preceding zodiacal constellations of Cancer, Leo and Virgo, the last the largest constellation of the zodiac.

Corvus, one of the two riders of Hydra, which long ago formed with it a triple constellation, referred to as "Hydra et Corvus et Crater", is a conspicuous little quadrilateral of stars about equal in area to Crux, The Southern Cross, and crossing the meridian at the same time. The writer was impressed with the beauty of this little constellation of Corvus as seen from Peru two years ago early in June, where it passed the meridian within only a few degrees of the zenith. In our latitudes it is seen so close to the southern horizon that it is much less noticeable than it is within the tropics, and this of course holds true for all of the constellations that appear here near our southern horizon and, in particular, those fine zodiacal constellations of Scorpio and Sagittarius, which lie so far south.

This time of the year is one of the best for those who wish to become acquainted with the leading constellations of spring and summer. Although the stars of spring are less brilliant than those of winter, the milder radiance of the spring and summer constellations is no less pleasing, and one may find it more enjoyable to stay out longer beneath the stars than on some of our winter nights.

The Big Dipper, which nearly everyone knows, is always one of the best constellations in our northern hemisphere with which to start a study of the stellar groups. One should know roughly how to estimate distances between stellar objects by degrees when referring to the relative positions of stars or groups near to one another. The two stars in "The Pointers" of the Big Dipper, so named because a line drawn through these stars in a direction upward from the bowl points to Polaris, the North Star, are separated by a distance of about five degrees, and the full extent of the Dipper is about twenty-five degrees. These measurements will be found useful when one wishes to give the approximate distance between two objects in the heavens. Arcturus is easily found by prolonging the handle of the Big Dipper downward a distance about equal to the length of the Dipper, and, with Arcturus identified, one will be well started on the way to making the acquaintance of other neighbor-groups. These might include that beautiful little circlet of six stars known as Corona Borealis, which lies about twenty degrees to the northeast of Arcturus. Alphecca, or Gemma, is the name of the star of two-and-a-half magnitude that represents the brightest jewel in the Crown. One should, by the way, be able to distinguish approximately between stars of different magnitudes. Vega, as we have said, is of nearly zero magnitude, Spica of first magnitude, the North Star of second magnitude, and the stars in Corvus approximately of third magnitude. The faintest star visible without binoculars or telescope is of sixth magnitude.

The planet Mars, which will be at close opposition in July, is now rising about midnight in the southeast. By the end of the month it will surpass all stars but Sirius in brightness. Mercury reaches greatest elongation west of the sun on May 1, and then rises about an hour before the sun. On May 10 it will be in close conjunction with Saturn, which in turn will be in conjunction with Venus on May 16. Jupiter, also in the morning sky, rises about two hours before the sun in Pisces.

There will be a total lunar eclipse on May 3 invisible in the United States and Canada, but the beginning will be visible in Alaska. It will be seen generally in the Pacific Ocean, Asia, Africa, and part of Europe.

LIGHT By Oscar Ostlund

We need, the Heavenly Father knows,
The brilliance which is Fomalhaut's.

Native Shrubs for Home Planting

American species valuable; best if nursery-grown

By VICTOR H. RIES

THE SHRUBBY CINQUEFOIL
A native of swamps and bogs, it gives a profusion of yellow blooms throughout the summer. It may be used most effectively as decoration for the home grounds

CONSIDERING the United States as a whole, home owners enjoy a rather wide choice in native shrubs, although those in any one section may not be very diversified. For many years the more sentimental landscape architect has recommended the rather indiscriminate use of our native shrubs, whereas the more practical man has simply used them along with the many non-native ones that are being grown in our nurseries. So, before we consider our native shrubs, it may be well to compare them with foreign introductions. It so happens that, with the exception of a few prairie and marsh species, the majority of our native shrubs are woodland plants. This often restricts their landscape use. Also, around our homes we wish to avoid any overgrown effect, so must use many low-growing shrubs, and the majority of our native ones are tall-growing. This does not mean that we should not use our native plants, but rather that we should show a little more discrimination in their use.

Some think that it is a simple matter to go out along our fence rows, or into our woods, and gather native shrubs for home planting, without any thought to the types of root system, or to their reaction to the shock of transplanting. Actually, unless relatively small and young ones are selected, and unless they have balls of earth to protect the root system, the wild-grown shrubs will not be nearly as satisfactory as the same varieties purchased from a nursery. With a wide range of shrubs grown in our nurseries today, there are few of our native shrubs that are not available as nursery-grown plants.

Outstanding among all the groups of shrubs are the viburnums, a group found almost entirely in either woodlands, or in swamps, and, which, if planted in full sun, require a reasonable amount of soil moisture. In very dry sections, or in dry places such as beneath a big soft maple tree, the viburnums will seldom be satisfactory, the foliage scorching in a dry situation in the sun, or the growth being unsatisfactory in dry shade.

Considering the species, not necessarily in order of choice, because that would be largely personal, we find first throughout wooded areas of the eastern United States the maple-leaf viburnum, *Viburnum acerifolium.* Ordinarily a scraggly-growing bush, it makes an excellent compact growth if pruned clear to the ground two or three springs. With berries during the late summer, and brilliant fall color, it is well worth wider use.

The withe-rod, *Viburnum cassinoides,* is not always recognized as a viburnum, since it lacks the usual rather prominent venation of the leaves. It is lower-growing than some other viburnums, and may be used for sunny or shaded locations. In some sections it will fruit profusely, in others only a little.

The arrow-wood, *Viburnum dentatum,* is one of our

THE HIGHBUSH CRANBERRY
This one of the viburnums makes an excellent background shrub and may be planted either in sun or in shade

old standbys with excellent foliage, good bloom, and blue-black berries that stay on all winter. It may be used for hedges, in mixed shrub borders, or as specimen plants.

The nannyberry, *Viburnum lentago,* is essentially a field plant, although it does equally well in the shade. A rather upright, free-growing shrub, often multiplying by suckers, it adapts itself to home conditions. Its shiny leaves with their brilliant autumn color, and its large drooping clusters of blue-black berries, make it one of the most desirable of the viburnums and yet it is seldom used.

The blackhaw, *Viburnum prunifolium,* is known to every farmer in its range, growing along the edges of his woodlots, and yet, despite its adaptability to home purposes, it is seldom used. Its horizontal branches often make it an excellent substitute for the more difficult flowering dogwood.

The high-bush cranberry, *Viburnum americanum,* is practically identical with the European plant that is so commonly seen in our gardens; in fact it is often difficult to distinguish between the two. Its bright red berries and its autumn color make it one of the most desirable. As a matter of interest, its European sister is the parent of the well-known common snowball.

There are a number of other native viburnums, but these are, for the most part, variations or only slightly different from those we have mentioned.

The dogwoods are another outstanding group. Although everyone seems to be familiar with our native flowering dogwood, *Cornus florida,* found throughout the eastern part of the United States, there are many who cannot grow it successfully. Since it does prefer woodland conditions, when used around our homes it should be given plenty of leaf mold or peat moss in the soil, and should have the trunk wrapped with burlap for a couple of years to exclude the borers.

Similar to the last in its habit of growth, and much hardier, although lacking in the showy blooms, is the alternate-leafed dogwood, *Cornus alternifolia.* It seems a shame that this lovely shrub is not known and appreciated and more widely used. It is especially fine as a specimen shrub, where its horizontal branching habit can be enjoyed to full advantage.

Among the red-twig dogwoods, our native red osier, *Cornus stolonifera,* found in swamps and along ditches, often produces as fine a red twig as any of the European forms. As purchased from nurseries, if grown from seed, it may vary from a good bright red twig to almost green twigs. The best color is obtained by cutting the branches to the ground every year or so to get plenty of new growth, for it is the fresh-grown twigs that exhibit the best color.

ONE OF OUR NATIVE DOGWOODS

Most of these shrubs give year-around enjoyment and there are several native species of this interesting group

Somewhat resembling the red-twig dogwood, but with more purple twigs, is the silky dogwood, *Cornus amomum,* found in many of our swamps and usually separable from the others by its brown instead of white pith. Although essentially a swamp shrub, it is equally at home in any good soil.

Rather widely used for its excellent foliage is the gray dogwood, *Cornus paniculata,* so common along fence rows and roadsides. Suckering rather freely, it forms dense thickets. Its white flowers and white berries, although not showy, add to the effect of the excellent foliage.

Although there are a number of other dogwoods native throughout the country, the above are the ones most likely to be encountered.

The genus *Euonymus,* although largely represented in our gardens by European and Asiatic forms, contains three native forms that should not be overlooked. The burning bush, *Euonymus atropurpureus,* is rather tall and tree-like, quite similar to the European form. Its fruits, resembling those of bittersweet, are decorative throughout most of the winter. Smaller in habit of growth, more shrub-like, with dark red warts all over the outside of the fruits, is the strawberry-bush, *Euonymus americanus.* Both of these will grow in either sun or shade.

Growing in many of our wooded areas is the running strawberry-bush, *Euonymus obovatus.* Being only a foot high, it makes an excellent ground cover in shaded areas.

Along our streams grows ninebark (*Physocarpus opulifolius*), often sold by nurserymen as a spirea. Its most interesting time is in late June when the seed pods turn brilliant red. It will grow in sun or shade, but, being a big shrub, will require plenty of space.

In our wooded areas the spicebush, *Benzoin aestivale,* furnishes one of our earliest spring blooms, its tiny yellow flowers being borne in profusion along the twigs, and followed in late summer by red (Continued on page 291)

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Diane Thome's DOG COLUMN

The Dog in the City

A MOVEMENT begun quietly some time ago would take and keep dogs out of our cities. It has gained considerable impetus recently. In fact, it may be safe to predict that within one or two decades there will be no dogs, or few, living in large cities.

The drive to abolish the apartment-dwelling dog from the city was naturally met at once by vigorous opposition from the thousands of dog-owners and dog-lovers who contended that the fact that they themselves had to live in cities was no reason why they should not enjoy the companionship of a dog. They also declared that a trained dog was not a nuisance in the city, and that the dog trained to the city was not necessarily unhappy. Not only were they disinclined to give up their dogs in response to the clamor—they flatly refused to do so.

Many famous and influential people have, in the interim, come forward in defense of the city dog. They have asserted that dogs ask nothing more than to be happy with their owners; that the hardships they suffer in cities are exaggerated, and that the nuisance alleged against them is also overdrawn.

Nonetheless many hotels and new apartment-houses, where dogs were at least tolerated, now bar the dog and the dog's owner as tenants. This is especially true of New York, but the movement is gaining ground in Chicago and elsewhere.

It is a fact that conditions a few years ago in New York City were such that the city was warranted in compelling dog-owners to "curb" their dogs and providing punishment by fine and imprisonment to those who failed to obey the warnings now posted at every street corner. While a greatly improved situation is found today, there is still protest from those who do not have dogs. Yet the movement against the city-dwelling dog is really due not so much to the dogs themselves as to the incompetence, laziness and stupidity of the dogs' masters or mistresses.

However, it is not merely the voice of the man or woman who does not possess a dog, or does not love dogs, whose protest is heard today. Many humane, intelligent and far-seeing and dog-loving people insist that the modern city, with its paved streets, its heavy traffic, its dearth of exercise space, and its lack of trees and grass, together with the steadily decreasing space in the apartments themselves, make life in the city uncomfortable or dangerous both for dog and child. It is a fact that the cramped space in an apartment of today is scarcely large enough for freedom of movement by the human tenants. One has to admit that, at best, leashed and muzzled, padding the pavement and insufficiently exercised, the poor dog is but a willing or unwilling prisoner in the city, pining his life away instead of giving it canine expression.

Dog-owners (and dog dealers) however, taking the other side of the argument, say that everything depends on the owner and on his training of his dog, and that a dog properly trained and properly cared for may lead a clean, orderly, happy and contented life in any city!

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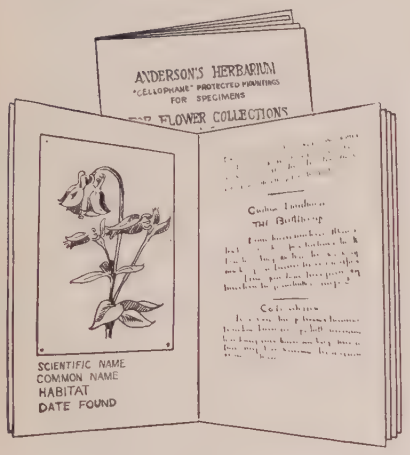

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in a city apartment and loving a dog should feel it a shocking deprivation to be compelled to give up this pet. Also, those who depend on any business relevant to dogs, such as kennel keepers and dog dealers, dog food and dog medicine makers, veterinarians and others, naturally resent a movement that would curtail the number of dogs kept. Those who have country places, servants and motor cars fail to see why they may not keep their dogs in their city apartments when they so desire. And, besides, the poorer people do not see why their children should give up Rover, Slug or Bozo who plays with them in the streets. They, unfortunately, permit their sentiment to outrun their sense of responsibility towards the well-being or behavior of their dog, and probably contribute most to the prevailing unrest. There are, again, childless couples who fail to see the reason for being deprived of their Scotty or Peke who is well mannered, healthy and happy.

But, it is not difficult to read the meaning of the writing on the wall! The time is not far distant when dogs and dog owners must live outside of large cities. In the opposition to this decree the wish, in most cases, is father to the thought.

Probably then there will be fewer dogs, but not necessarily fewer dog-lovers.

Summer Nature Camp

Pioneer among Nature camps for teachers, scientists and Nature lovers, the Pennsylvania State College camp will hold two sessions this year, the first from June 29 to July 20, and the second from July 19 to August 9. Established in 1923, the camp offers an ideal "vacation with a profit." Full details of the courses, credits available, and qualifications may be obtained from Professor George R. Green, State College, Pa.

A Delightful Book

Interesting as many records of bird study may be, few make entertaining reading. *The Watcher at the Nest* by Margaret Morse Nice is a notable exception to the rule. Here is a charming record of bird observation, written with both a gentle humor, and a fascinating and informal style. The first ten chapters of this delightful book (if you want to give something to a bird-loving friend this is the answer) are devoted to the story of two male song sparrows, their ladies and their offspring. During eight years of watching, Mrs. Nice found amazing and amusing variations in personality and in behavior among birds of the same species. She saw drama, grief, humor, anger and many other things that we humans often consider only in human terms, and all these, combined with a charm of telling, make this a fascinating book. The last nine chapters are devoted to other bird observations, all of interest and delightful to read. Mrs. Nice, who is president of the Wilson Ornithological Club, has, in this volume, the pictorial collaboration of Roger Tory Peterson, who has effectively caught the individuality of the bird actors in the story. We heartily recommend *The Watcher at the Nest*, which is published by Macmillan at two dollars.

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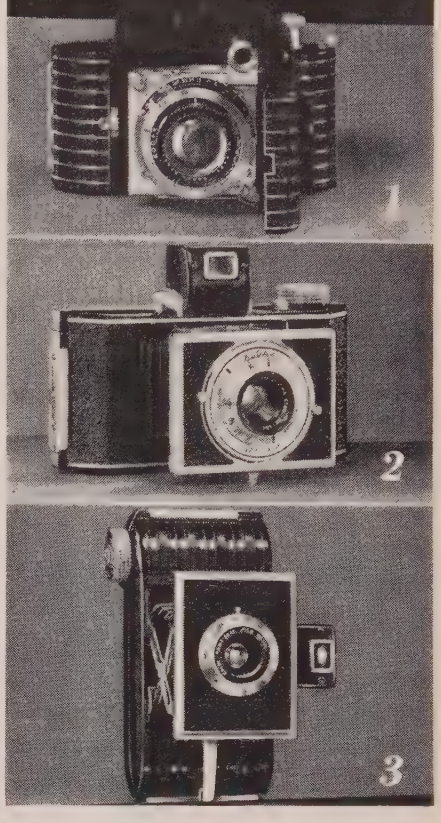

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THE SCHOOL PAGE ★★★

EDITED BY DR. E. LAURENCE PALMER

Professor of Rural Education, Cornell University, and Director of Nature Education, The American Nature Association

Education à la Convention

It is probable that the democratic philosophy can best be worked out through the convention of interested parties and a free exchange of ideas, which may or may not be in agreement. This article will be published in an offseason period between the usual winter meetings and the huge conferences of summer. It is written to present one participant's impression of the meetings of the Wildlife Conference in Detroit in February and of the organizations associated with the American Association of School Administrators, which met in Cleveland. Some of the deliberations of these meetings may have a bearing on what may take place in the summer meetings. Some of them demand serious consideration.

It is encouraging that many of the ideas presented at the Wildlife Conference would have been given no consideration a few years ago. "Vermin" campaigns, for instance, were effectively denounced by most of the speakers who considered them. Where farmer and sportsmen relationships were formerly considered only from the sportsman's point of view, the farmer's rights were both defended and recognized. In fact it seemed evident that in the future the interests of the sportsman can best be satisfied through courting the cooperation of the land owner instead of trying to beat him out of that to which he is justly entitled. An end to free shooting except upon public lands was definitely indicated from more than one locality. If game is a crop, the owner of the land on which the crop is raised seems destined in the future to get some reward for his contribution.

Even more encouraging than these developments was the recognized interest shown in educational activities, whether these be through the schools, the public press or other channels. A dynamic group of outdoor writers advanced the idea of sponsoring a fellowship to assist in the development of professional work in their field, and at least three speakers in the general program testified to public interest in wildlife problems being on the increase. Only one of these apparently failed to recognize a difference between selfishly organized propaganda and true, impersonal educational practices. An overflow meeting one evening, where no specific program was announced, attempted rather unsuccessfully to crystallize sentiment in educational matters. There seemed to be a general willingness of organizations outside the Conference to cooperate if and when a representative program could be advanced by the Conference's educational committee. What that program might be and how it might be developed was not presented at the Detroit meeting. Films planned for school use and prepared by William L. Finley, and an animated cartoon on conservation by "Ding" Darling, were given an enthusiastic reception by those who were interested in the educational aspects of wildlife conservation.

It is to be hoped that the evident interest in educational matters as they apply to wildlife will not be allowed to be dissipated. A real opportunity for cooperative effort exists. It should not be neglected or placed in jeopardy by real or imagined differences of opinion of a minor nature.

Whether conservation education will be carried on by the schools, by the radio and press, by the moving picture industry, or by the host of junior organizations that are springing into being is not evident, but that it will be advanced by some of these agencies is certain.

At the Cleveland sessions of the educators, three groups with interests in this general field held meetings. One of these was a committee meeting of the Department of Science Instruction of the National Education Association, headed by Ira Davis of the University of Wisconsin. This committee of fourteen, with a group of seventy-two consultants, is known as the National Science Committee, and plans to recommend a program in science for the first fourteen years of the school experience. It has groups interested in science in the elementary school, in the junior high school, in the senior high school and at the college level. The members of these committees are realigned in other temporary committees at present working on problems of philosophy, needs of a personal and social nature, evaluation, teacher training and administration. In spite of the fact that one member of the committee indicated to the writer that all that would be asked of participants would be to "vote 'Yea'" on a prearranged program, and in spite of the fact that there was, on occasion, evidence that there might be something to the suggestion, it is hoped that this committee, which has a real opportunity, will produce representative recommendations that can be accepted by the groups cooperating and which can be put into effect generally. Suggestions with regard to the work of this committee should be directed to its chairman, Ira Davis.

The National Council on Elementary Science also met in Cleveland. The attendance was a triumph for the local chairman, Nellie Melrose. Some fifty out-of-town guests mingled with the host local teachers. Since the Council was founded in 1920 to meet the specific needs of school garden supervisors and Nature study teachers in actual service, it has changed its name and its emphasis repeatedly. The writer imagined he heard the rustle of the shade of Alice Jean Patterson and the *in absentia* protest of some of the other founders when one speaker recommended, as desirable products of elementary school science experience, such statements as, "We can be kind to our tree. That will be a nice Christmas for it", "Some snow fell to-day. I think our tree was glad", "Our tree is bare now. It looks cold. It looks lonesome. It does not look happy". However, a demonstration lesson was subsequently given and it illustrated splendidly how elementary children might have worthwhile science experiences today along the lines laid down by Sheldon in the Oswego Normal in the sixties, and by Jackman in Pittsburgh and Chicago in the eighties and the nineties. It was entirely commendable.

One of the best talks of all the conferences referred to in this article was given at the luncheon meeting by Dr. Dietz of the Scripps-Howard newspaper organization. He gave added emphasis and support to the value and importance of science education through the channels of the press. His talk showed that if the schools continue pedantically to emphasize academic activities and ignore realistic science experiences, some of their educational functions will be taken over by other agencies without much further delay.

As is usually the case, the National Association for Research in Science Teaching was in session, and, as is usually the case, the organization made some recommendations with which the writer cannot agree. This year a committee charged with making recommendations to the College Entrance Board advocated a science sequence in high school that would call for general science in the seventh, eighth and ninth grades; chemistry in the tenth grade; biology or physics in the eleventh and twelfth grades. This recommendation was made on the assumption that the general science of the seventh, eighth and ninth grades was largely biology, and that chemistry was more basic to studies in biology and physics than was the present tenth-year biology basic to chemistry and physics.

Examination of courses of study in general science and of text-books in that field does not indicate that the assumption that the work in this field is largely biological is sound. In fact, it would seem that the physical sciences, at these levels, are given more emphasis than the biological sciences. No proof that this assumption was valid was given except for the word of the chairman of the committee, a chemist. The writer does not accept the assumption.

There may be logic in the assumption that chemistry is more basic to biology than biology is basic to chemistry, but educational programs are not based solely on logic. One might say that it is logical to teach high school biology by beginning with a one-celled organism and following on up through the phylogenetic tree, but any one who has tried this on high school students knows that there is something psychologically wrong with the system. High school science sequences should recognize the social and individual needs of the students, instead of limiting themselves to building up some logical series of intellectual gymnastics.

It is not inconceivable that a biological organism with the stomach ache may have a desire for information about chemical reactions. Why cannot biology provide a setting for the work in chemistry and physics? And can it be possible that this recommendation is based on the assumption that chemistry teachers without jobs would be better off if they had the tenth year classes normally taught by the biologists? This was indicated as a possibility by a member of the executive committee of the National Association for Research in Science Teaching. The solution of this problem holds much of interest for future discussions of the organization. What is finally recommended may have a bearing on the interests of many biology teachers. More important than all of these is the fact that, should the College Entrance Board accept this recom-

(Continued on page 289)

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THE PENNSYLVANIA STATE COLLEGE
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THE SCHOOL PAGE

(Continued from page 288)

mendation, hosts of high school students who need to know about themselves and the plants and animals with which they live would be denied this privilege until they had waded through a year of high school chemistry. What the results of such a program would be we leave to you to answer.

INDOORS AND OUT

(Continued from page 247)

we are able to communicate our enthusiasms and we can trust that those who find pleasure in outdoor Nature will increase in number.

In the midst of territorial aggrandizements, we can go on observing our wildlife weeks in the faith that when wars are over there will still be a door through which we can escape from "moral doubts and strivings." Despite the exigencies of living in the sort of world in which we must apparently do our best for some years yet to come, we can at least in this way minimize our departures from sanity and maintain our avenues to serenity. There is some assurance in the fact that Viscount Grey's *Fallodon Papers* and *The Charm of Birds* seem of much more importance to us today than his *Twenty-five Years*.

Get Together, Boys

Within one week three members and readers have written us asking to be placed in touch with others interested in exchanging specimens and information about reptiles. We have frequently published the names and addresses of members wishing to reach like-minded readers, and are happy to do so for these three herpetologically-inclined young men. They are William Chapel, 801 North Riley Avenue, Indianapolis, Indiana; Harvey Camin, 12613 Edmonton Avenue, Cleveland, Ohio, and Paul Wurgel, 134 Oak Street, Weehawken, New Jersey.

Virginia Birds

Virginia bird lovers will be interested in *The Birds of Lynchburg, Virginia, and Vicinity* by Ruskin S. Freer, published as a bulletin of Lynchburg College. The booklet is based upon fifteen years of observation and study of the bird life of the region.

British Mammals

Wild Animals in Britain by Frances Pitt is a popular discussion of the life habits of the large and small mammals of England. The life history material includes much personal experience and observation by the author. While there are many books on Britain's birds, the number of mammal books is much more limited, and Miss Pitt's volume should find a welcome audience. It is attractively written and includes many splendid illustrations. It is published in this country by Charles Scribner's Sons and sells for $3.50.

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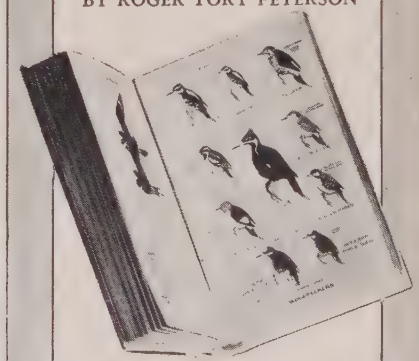

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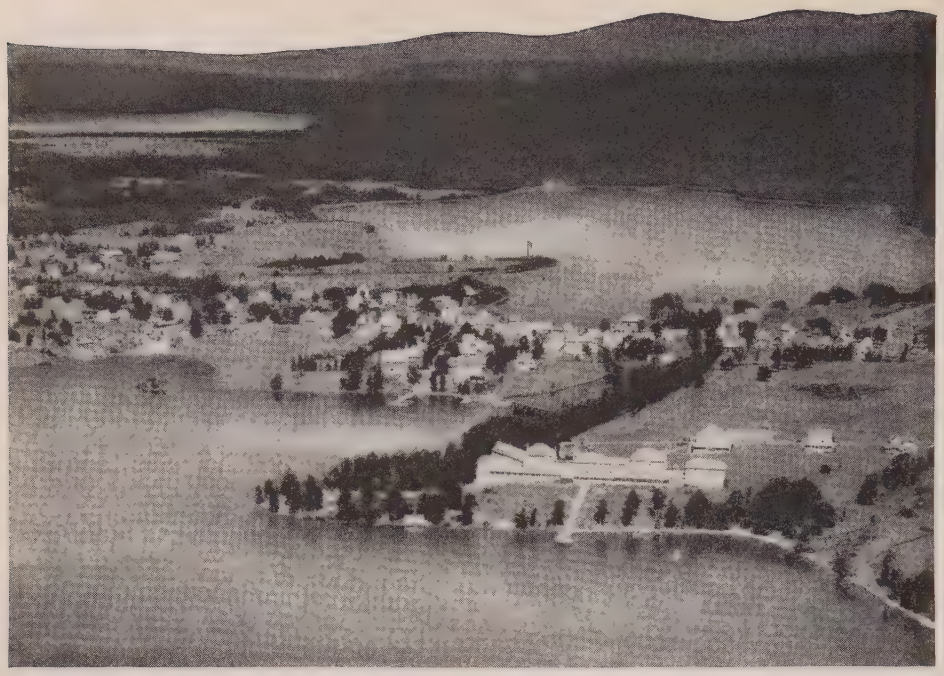

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Guide to the Birds

Covering North American birds east of the Rocky Mountains, *A Field Guide to the Birds* by Roger Tory Peterson is a valuable addition to the bird student's library. Mr. Peterson has approached identification from a different viewpoint—although one that he has long followed himself—that of recognition of the fact that color values rather than the actual colors are most important in identifying birds at a distance. All of Mr. Peterson's drawings, which profusely illustrate the book, carry out this plan. The present volume is a revised and expanded edition, the first edition having appeared in 1934. Pocket-size, this book merits the attention of every bird lover. It is published by Houghton Mifflin Company at $2.75.

Poison Ivy

The most recent addition to the Field Museum of Natural History series of leaflets to come to hand is entitled *Poison Ivy* and is written by James B. McNair. It should be most valuable to anyone who ventures where this plant is found and knows little or nothing about it. Remedies are included. Copies are available from the Field Museum of Natural History, Grant Park, Chicago, Illinois, for fifteen cents. This is a second edition of this popular and useful booklet. The same author also brought out in 1923 a careful and exhaustive discussion of poison ivy and poison oak from the botanical, chemical and pathological points of view. This formed the book *Rhus dermatitis,* published by the University of Chicago Press to sell for four dollars. Realizing that there was no treatment for this poisoning based on its chemistry, Dr. McNair conducted a protracted study of the entire subject. The larger volume is of particular interest to dermatologists and botanists, although, of course, its bibliography and references pre-date its appearance sixteen years ago.

Caring for Lilies

Gardeners who have a special interest in lilies know that, lovely and fascinating as they are, they can be exceedingly difficult and exasperating. It behooves such enthusiasts, therefore, to know as much about these flowers as possible. The opportunity is offered in *Lilies for American Gardens* by George L. Slate. Here is a volume treating with lilies from their history down to existing species and varieties. It includes practical information on their care, their enemies, their breeding and propagation. Excellently illustrated, this valuable book is published by Charles Scribner's Sons at $3.50.

Schnauzer Tells His Story

Yours Faithfully is the title of an attractive little book of special appeal to dog lovers. It is the autobiography of a Schnauzer written with a keen appreciation of the dog and his viewpoint by Cyril Nash, British actor and playwright. The book is published by Longmans Green and Company at two dollars.

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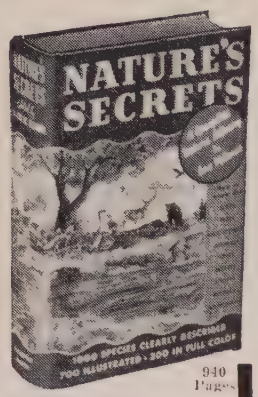

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NATIVE SHRUBS FOR HOME PLANTING

(Continued from page 285)

berries. Although at home in any good garden soil, it is all too seldom grown.

Likewise, in our swampy areas, the winterberry or black alder, *Ilex verticillata,* if we will remember that we must have a male for one or more female plants, makes an excellent garden subject. Unlike the American holly, it sheds its leaves, but has red berries that are just as decorative.

The sumacs offer a variety of form. Although most are familiar with the common staghorn sumac, they usually overlook the dwarf sumac, *Rhus copallina,* and that delightful creeping shrub, the fragrant sumac, *Rhus canadensis.* Those who are fearful of being poisoned by the deadly poison sumac of our swamps and the poison ivy, need only avoid those forms having white berries.

A number of the native shrubs require an acid soil and consequently are difficult to grow in those sections that are naturally lacking in this type of soil. Included in these acid-soil shrubs are the various forms of rhododendrons, azaleas, mountain laurel, sweet-fern and Leucothoë.

Other native shrubs that are sometimes used are the witch-hazel, New Jersey tea, chokeberry, indigo-bush, *Amorpha fruticosa,* the lead-plant, *Amorpha canescens,* button-bush, and the various wild roses. Besides our native shrubs, we often find in various parts of the country some escaped cultivated shrubs such as the Japanese barberry, Ibota privet, European privet, Morrow honeysuckle, Tatarian honeysuckle, flowering almond, rose-acacia, and others.

In using any shrub, whether it be a native or foreign plant, it is always well to estimate its ultimate size, that is, how tall it will be in, say, ten years, and how much it will spread. Then such shrubs may be selected that, when they are mature, will not have to be cut back to prevent blocking views from windows, porches, or which, due to excessive width, will crowd drives, sidewalks and entrances.

Shrubs, like all other plants, appreciate fertile soil. You will also find that an ample mulch of strawy manure or other material over the entire root system of the shrub, especially during the summer months, not only serves as a weed control, but also conserves moisture. These helps will be reflected in the increased growth of the shrubs.

Once again the prospective user of native shrubs should be cautioned that in the majority of cases it will be far more satisfactory to purchase young stock from a nursery rather than attempt to collect them from their native haunts.

Rose Don'ts

1. Don't let roots on new plants dry out and don't let them stand exposed to direct sunlight. If the weather does not permit planting when the bushes are received, take the bundle out of the paper and bury it, covering both tops and roots with soil. Keep rose bushes damp, neither drowning them with water nor allowing the package to lie around and dry out, if you expect good results.

2. Don't expect roses to fight for a living where shade trees are sapping the soil. Cut

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4. Don't over-water roses. Roses should be planted close enough together so that they shade the ground and keep it cool. Watering is unnecessary except in extended drought. Then soak the ground for several hours and let it go for a number of days or a week.

5. Don't let insects eat the leaves off your bushes and then expect good growth. Spray with "Black Leaf 40," which will protect you against aphids and similar insects. If rose chafers bother you, knock them off into a pan of water covered with coal oil.

6. Don't let black-spot or mildew get ahead of you. A suitable dust can be had from any seed store. These are diseases and must be treated accordingly.

7. Don't give up. It is not a difficult task at all to grow roses once you learn the few simple rules involved. A rose garden is worth all the trouble it takes, and more too.

Bird Check Lists

For the convenience of those who wish to keep a daily list of birds seen, the Michigan Audubon Society has issued a check list of "Birds of Northeastern United States." These are available from the Society's headquarters, the Grand Rapids Public Museum, Grand Rapids, Michigan, for ten cents a dozen, forty cents a hundred, eighty-five cents for 250 and three dollars a thousand.

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Gardening in the Shade is the descriptive title that H. K. Morse gives to a book that should find a welcome with many gardeners. Here is a book based upon long experience in overcoming obstacles in the garden. It brings out that there are degrees of shade and that planting must be adjusted accordingly; that shade and soil conditions offer special problems. The inclusion of a list of some five hundred perennials, annuals and shrubs that are tolerant to varying conditions of shade is specially helpful, and cultural advice is given in connection with each one. This volume is published by Charles Scribner's Sons at three dollars.

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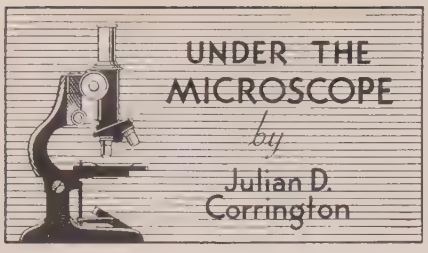


DESMIDS

The most widely studied group of algae in the field of microscopy is that of the diatoms, and while they justly deserve the great interest they attract, it would be a mistake on that account to neglect another assemblage of interesting microscopic forms of not too distant kinship to diatoms, the desmids.

These are one-celled relatives of the well-known Pond Scum, *Spirogyra,* both being incorporated in the Order Conjugales of the Green Algae because of similarities in modes of reproduction. Desmids average a bit larger than diatoms and some are recognizable without magnification, though a microscope is essential for any detailed observations.

Desmids are of a singularly beautiful, bright grass-green color and appeal also because of their geometrical designs along with elaborate sculpturing. Unlike diatoms, whose valves are composed of silica, desmids have cell walls of cellulose. The single cell often appears as if it were two cells, owing to a marked constriction between the two halves, known as semicells; however, there is a single central nucleus between these halves. A few species are filamentous, occurring in long strands.

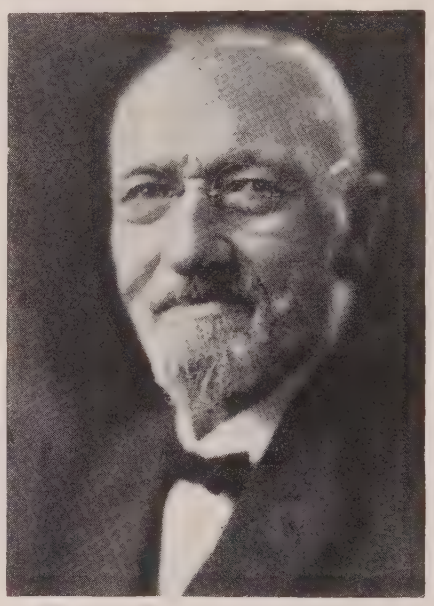
Each cell is organized into two perfectly symmetrical halves, one of which duplicates the pattern of the other. In each semicell the large green chromatophore is very conspicuous and characteristic. Reproduction occurs in two ways. Individual cells multiply rapidly at night by regular cell division across the middle constriction. Each daughter semicell then must grow a duplicate of itself in order to reconstruct the adult condition. At times, the halves of cells break apart and the naked protoplast then escapes as a non-motile gamete. These conjugate in pairs and fuse to form a thick-walled zygospore, as in *Spirogyra.* In some species, as *Closterium* and *Cosmarium,* each zygospore on germinating after a resting period produces two adult desmids.

Certain movements performed by these cells were for a long time not understood, but are now known to be caused by delicate threads of protoplasm extruded through the cell wall, and effected under the influence of light.

Over one thousand species are known, the group being sufficiently large as to merit the detailed work of specialists. They are also abundant in the fossil state. All species are fresh-water only.

Desmids abound in situations where there are clear, sunlit bodies of fresh water, but are more abundant in soft than in hard waters. Collecting is performed with a fine-meshed towing net for plankton forms, and by scrapings with a spoon on the mud and other bottom material of ponds for the non-floating types. City reservoirs make good collecting sites; indeed, these algae are often troublesome as polluters of drinking water. Chamberlain reports that he has found *Micrasterias,* one of the most elaborately beautiful genera, so loosely attached to the stonewort, *Chara,* that a quart bottle full could be squeezed off in a few minutes, and that he encountered an almost equal concentration of *Cosmarium* in a watering trough.

Birge and Juday, in studies of the water of Devil's Lake, Wisconsin, found, on June 15, 1907, a concentration of *Staurastrum* of 176,000 plants per liter of water at a depth of three meters. These waters were strongly alkaline. On the other hand, *Micrasterias* is a typical inhabitant of the acid waters of peat bogs and may be collected in quantity, along with an assortment of many other desmids, by squeezing sphagnum moss and examining the runoff water. The colder northern waters have a more prolific desmid flora than warmer pools of the south. All species require an abundance of sunlight to perform photosynthesis.



JOHN J. BAUSCH

The Microscope Makers

A department like *Under the Microscope* has a considerable advantage over regulation books or magazine articles dealing with microscopy in that every sort of item pertaining to this field can be included with propriety. Elementary notes, advanced technical features, exchanges, club news, history, contests, commercial and advertising announcements —all are certain to prove of interest to anyone who makes the microscope his hobby or profession. Some of our subjects can be found in textbooks or reference works, others in catalogs and magazines, while there are still others not readily available at all to the general reader. Hence we believe that, aside from bringing much of this material together under one cover, a decided value of this sort of department lies in directing the attention of readers to channels leading off from the main subject that he may never have thought of at all, or at least never explored.

Among such interesting side lanes is a new series, of which this is the first installment, on the famous manufacturers of optical instruments. Devotees of microscopy should indeed know something about these great firms —where they are located, what they produce, by whom and when founded, together with a certain amount of biography of their leading personalities. We shall begin with one of the best known, an American institution with an international reputation. Others will follow at intervals in succeeding issues.

The founder of the largest American optical firm was John J. Bausch, one of a family of seven children, born at Gross Suessen, Wuertemberg, on July 25, 1830, the son of a baker. Europe at that time was engulfed in poverty and the Bausch family formed no exception, all members having to struggle hard for a bare existence. We read that John, at the age of fourteen, was apprenticed to his brother, an optician, and that while he could make as many as six pairs of spectacles in a long day of gruelling labor, he received but six cents a pair for them. At eighteen, with a pack on his back, he walked to Berne, Switzerland, but found the eyeglass business no better there, and so, in the spring of 1849, young John set forth to America, against the counsel of his family, sailing from Havre on a stormy voyage that required forty-nine days.

New York City was crowded with immigrants, so John pushed on west to Buffalo. Here, too, disappointment met the enthusiastic young German at every turn. The city was stricken with an epidemic of cholera and no opticians were wanted. He worked as a cook's assistant, and tried to earn a living at woodturning, but met with no success, and in 1850 borrowed five dollars and moved to Rochester, only to find there the same struggle in his efforts to gain a foothold. John sent home for his share in his father's estate—a little less than one hundred dollars—and opened an optical business by renting a watchmaker's window for one dollar a week. But no one came to buy glasses and an effort at house-to-house sales also failed. Again he tried woodturning, this time with some temporary success, so that he was encouraged to try the venture of matrimony. Then, seven weeks after the wedding, he lost two fingers in an encounter with a buzz saw!

In a sense this was a fortunate turn, for it forced him back to optical work and also brought a young friend, Henry Lomb, a carpenter, who raised a subscription of twenty-eight dollars for the stricken man. Mr. Bausch recounts, too, that his application for membership in a lodge was turned down as a result of this accident, which refusal only fired his ambition the more.

By the time his eldest son was born, John J. Bausch was earning about four dollars a week by doing odd jobs to supplement his spectacle making, conducted in a small space in the front of a shoemaker's shop in the celebrated old Reynold's Arcade building. Henry Lomb, who had crossed the Atlantic one month before Bausch, was unmarried, and also made about four dollars a week. One day when Bausch was at the end of his rope, he asked his friend how much money he had been able to save.

"Sixty-two dollars," replied Lomb.

"Lend it to me," said Bausch, "and when my business grows large enough so that it can support us both, you shall have a half interest."

This was done, and although there was no written agreement whatever between the two lifelong friends, this sixty-two dollars was destined to make Lomb a man of wealth.

The first years thereafter, however, were to bring one discouraging failure after another. The little firm moved and moved repeatedly, never being able to make a go of it. Then came the Civil War and the immediate enlistment of Lomb, who organized a company of six hundred Rochesterians born in Ger-

(Continued on page 296)

AMERICAN SOCIETY OF AMATEUR MICROSCOPISTS

Dr. Gage First President

Just as we were going to press for this issue, a letter was received from Professor Simon Henry Gage accepting our invitation to become the first President of our new Society. We believe this to be a most significant step forward and that it speaks very favorably indeed for the importance of such an organization of amateurs and its future success when a man of the caliber of Dr. Gage is willing to take the helm at the outset. This acceptance also should serve as a final answer to those teachers and others who have held off because of the use of the word *amateur* in the Society's official title. Dr. Gage, the best known professional microscopist in America, is not afraid of an alliance with amateurs. On the contrary, he writes:

"I believe so strongly in starting young people on the road to something really worth while and enjoyable that I would most willingly act as the first President. That I believe in your movement I will demonstrate by adding four members, Mrs. Gage and myself and my two grandchildren"—(check for four memberships enclosed). "As to the age of members, I think from 10 years up to 100 is about right. No restrictions on age, race or sex, simply that they are or hope to be interested in the revelations that the microscope can make to every one who looks into its magic depths."

On May 20 of this year, Professor Gage will be eighty-eight years young. At an age long past that when most persons who reach it would have retired from all activities and interests, he is still going strong and writes that he is so busy, we will have to wait awhile for his official word of greeting! He is still "young people" along with the rest of us.

To those familiar with the literature and personalities of microscopy, our new leader needs no introduction. For younger members and others who have but recently become attracted to this field we might state that Dr. Gage is Professor Emeritus of Histology and Embryology at Cornell University; that he has filled a long and busy life with active work and research in microscopy and allied subjects, publishing a great many original contributions; that he has twice served as President of the American Microscopical Society, the professional organization of this country; that he has an international reputation among microscopists; and that he is especially well known as the author of one of the standard works, *The Microscope,* now in its sixteenth edition. This volume was reviewed in the first issue of these columns, in August, 1937. Dr. Gage is easily the dean of American microscopists.

Many letters from members have been received and some checks for dues, though the latter should be speeded up considerably if you want action in the near future. Your Secretary cannot put his plans for you into execution without more of what it takes to pay the bills.

Typical of a number of letters from members is the following from E. R. Schowalter, Wichita, Kansas. "Your suggestion of appointing a Nominating Committee is o.k. with me. However, since you are so kind in offering to do all the work and are so well qualified to handle the entire setup as you see fit, I really believe all that is necessary to get started with the right officers in charge is for you to simply appoint such persons as you know can and will fill such positions to the best of their abilities. At the end of one year the members will then be better acquainted with the officers and fellow members and with the Society in general, and can make such changes as they wish at a regular election."

Apparently the membership is perfectly willing to let the Secretary proceed as he sees fit and to get the microscope focused in the most direct way possible. Accordingly, persons of the greatest prominence and influence are being asked to serve as officers, designs for an emblem are being drawn and a constitution whipped into shape. Many suggestions from members along these lines have been helpful, and our thanks goes to all those who have taken the trouble to write in or have offered help.

For example, to show the good old spirit that will help to put the Society over, Microfan Herbert Meyer of New York City, who is a professional artist, submitted two beautiful sketches for monograms and offers to execute the finished drawing for an official emblem without charge to the Society. . . . J. P. Gaehl, Standish, Michigan, sent in an admirably drawn emblem and a model constitution. . . . Boyers M. Clark, Elkins, West Virginia, offers the use of a complete multigraph and addressograph equipment if these will help out in any way. . . . A number of schools have sent for large numbers of questionnaires, from ten to forty each, in order to enroll local clubs.

Slide exchanges is another matter coming up shortly. Here's one for the idea-exchange type of benefit members will receive in special mailings: Frank Gogolak, Berwyn, Illinois, writes, "I have used the dioxan method you describe with success for the past year. However, during dehydration I do not change the dioxan. Calcium chloride or calcium oxide placed in the dioxan will absorb all water from it after the dioxan has removed it from the specimen. The calcium chloride should be separated from specimens with a fine screen. When the lumps of chloride have run together from the absorption of water the dioxan is poured off and used over again with fresh calcium chloride. A slight stirring once in a while during dehydration helps the process work better. Since the container is closed during the process and two or three changes are eliminated, this method also prevents the escape of the toxic vapors you write about."

Miss Alice P. Townsend, Red Bank, New Jersey, tipped us off to a new gadget we had not heard about previously, and we will therefore investigate this and report on it later.

The Washington office of NATURE MAGAZINE has enough worries of its own without burdening the secretaries with A.S.A.M. business. It has therefore been decided that hereafter all correspondence, including letters, questionnaires, dues and so on pertaining solely to the Society should be sent direct to Dr. Julian D. Corrington, 118 Water St., Chestertown, Maryland. Requests for catalogs, enquiries and other business pertaining to the Department, *Under the Microscope,* should as heretofore, be sent to Dr. Corrington at the NATURE MAGAZINE address in Washington.

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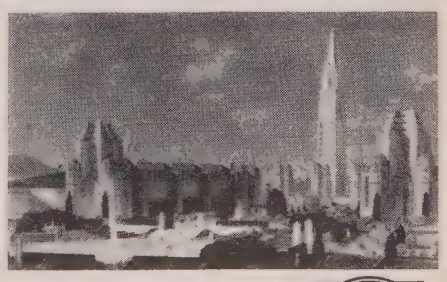

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UNDER THE MICROSCOPE

(Continued from page 294)

many, and who was advanced through lower grades to the rank of Captain. From his meager pay Lomb regularly sent back small sums all through the war years, enabling Bausch to carry on.

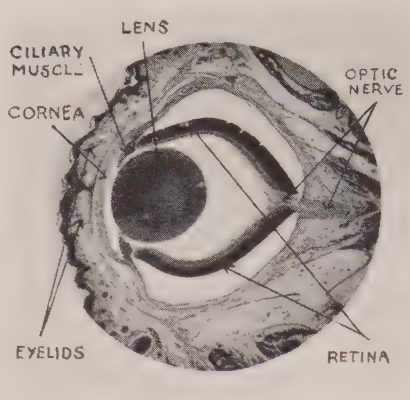
Then one day came one of those odd happenings, seemingly insignificant, which have sometimes marked the turning points in the affairs of men and nations. John was walking down the street in Rochester on an afternoon when his attention was caught by a small piece of hard rubber lying on the sidewalk. He picked it up and examined it, when the idea at once occurred to him that here was a splendid material from which to make spectacle frames. Before long this substance had demonstrated a great superiority over bone, horn and steel, and Bausch made better frames much more cheaply. At this time, too, he invented the first power lens grinding machine, a forerunner of the great batteries of power equipment that today turn out more than 15,000,000 ophthalmic lenses yearly.

One of the earliest chores of Edward Bausch, eldest son of John J., was to heat sheets of rubber on the family cook stove, then rush them out to the woodshed where his father fed them into a hand punch press operated by Lomb, now returned from the war. Money was still so scarce that a spoiled sheet of rubber could seriously embarrass the struggling firm, yet the turning point had come and before long it was decided that Henry Lomb should go to New York and open up a sales office while Bausch remained in charge of production in Rochester.

Not until 1890, however, after thirty-seven years in business, and when the founder had reached the age of sixty, did he and his partner begin to take any real money out of the business—a lifetime of bitter struggle for an ultimate success at an age when most men would retire! But not so John J. Bausch. He lived on to the remarkable age of ninety-six, and, until his death in 1926, kept up an unfailing interest in the enormous establishment which he, his partner and his sons had developed. At ninety the founder loved to stroll through the plant hunting up old employees and chatting with them about old times, when they all had hard sledding together. The Early Settlers Club was begun in 1916 for employees who had served twenty-five years or more, and the company has long been outstanding in its solicitude for the welfare of its staff, with pensions, group life and disability insurance provisions, training courses for young men, and rewards for ideas.

The first Bausch & Lomb lenses were of spherical surfaces, either double convex or double concave in form; then came the meniscus, cylindrical, and later the sphero-cylindrical, toric lenses and prisms, until today an enormous number of types are available to the optical profession, and a special illustrated magazine is issued for this division alone.

But the manufacture of spectacles, great as that became, did not satisfy Bausch, who had started with the idea of grinding lenses for the whole field of optics, whether for spectacles, cameras, microscopes or telescopes, and we shall see in the next installment of this series how this firm, under the leadership of the two sons, Edward and William Bausch, was to launch out into innumerable side fields which were to make this institution the largest of its kind in America, and the greatest lens manufacturers of the world.



Photomike Contest

Prize-winning picture for this month shows the eye of a mouse embryo, the section being mid-sagittal and passing through the optic nerve. All details are remarkably clear and diagrammatic. The winner, who made the slide as well as the photograph, is the Rev. John W. Baechle, C. PP. S., one of our readers who is taking courses in Histology and Microtechnique at the present time at The Catholic University of America, Washington, D. C.

The section was stained by the Brilmyer technique, a combination of Delafield's hæmatoxylin with Mallory's triple, and the photo taken with a Spencer microscope equipped with 6x ocular and 16mm. objective. The camera was a 2¼ x 3¼ equipped with a ground-glass back and a Zeiss 4.5 lens. With aperture at 4.5, the exposure was 30 seconds. Light source, a homemade substage lamp, no filter. Agfa Plenachrome film used with an adapter; print on No. 2 Velox.

Second place was earned by Simon Truman, New York City, for his view of potassium chlorate crystals under polarized light, and third place went to the Rev. P. E. Kuehne, St. Peter's College, Muenster, Saskatchewan, Canada, for *Spirogyra,* vegetative and conjugating filaments.

Remember that with the combination of several summer issues, there are only two more contests before next fall, so get busy, fans, and send in your best shots to compete for that five dollars award.

Trade Notes

One of the most interesting volumes to reach our desk in recent months is *Living Things, How to Know Them,* by H. E. Jaques, one of his Pictured-Key Nature Series, others of which will be reviewed here later. This book consists of 164 pages and more than 440 illustrations in the form of a graphic key to the phyla, classes and most of the orders of both plants and animals, along with study and field project suggestions. If as teacher, student, camper, scout or hobbyist you have any yen toward outdoor life and could use a handy reference manual for the identification of the things you find or collect, then you will be writing Professor H. E. Jaques, 709 North Main St., Mt. Pleasant, Iowa, and inclosing $1.00 per copy for spiral wire binding, or $1.80 for cloth binding.

A very handsome new catalog of 124 pages has just appeared from the firm of R. & J. Beck, Ltd., London, England. It is entitled *Beck Microscopes,* and will be sent without charge to institutions. As soon as local Chapters of our new national society are organized, this is one of the publications we can secure for the Club library. It is completely illustrated and includes instruments ranging all the way from small and inexpensive microscopes for the amateur to elaborate research outfits, together with many accessories.

* * *

Euparal is the trade name of a mounting medium designed by Professor Gilson, of Louvain, and manufactured by Flatters & Garnett, Ltd., Manchester 13, England. For sections, bacteria, textiles, insect parts and other objects, Euparal is superior to balsam in that it does not turn yellow with age or develop acid reactions. The lower refractive index (1.483) is an advantage in studying unstained elements, as fibers or mitotic spindles, while time and materials are saved, since Euparal clears well from the higher alcohols. One may transfer tissue directly from 95% alcohol into this mountant, without going through absolute alcohol or xylol. Also it is especially recommended for blood smears stained with Wright's. Ordinary Euparal is colorless and retails at $1.00 per ounce; Euparal Vert is green, containing a copper salt which intensifies hæmatoxylin stains, and costs $1.25 for a one-ounce bottle; Euparal Essence, at 65c per ounce, is used as a solvent to dilute either of the preceding should they become too thick, or as a bath for delicate objects in passing from alcohol into the mountant. The domestic agent for these preparations is the Arthur H. Thomas Co., West Washington Square, Philadelphia, Pa., one of the largest American apparatus and supply houses.

* * *

For distribution this month we have a limited number of copies of Watson's *Microscope Record* numbers 45 and 46, one of which will be sent to readers sending in a request with a three-cent stamp for postage, as long as the supply holds out. Those whose requests are received too late will be sent the catalog-of-the-month for June-July, so that we will not be under the necessity of using a stamp to return a stamp. How to isolate fungus spores, photograph bacterial colonies, study microfossils, make drawings with the camera lucida, construct a work table for the microscope and use infra-red light for photomicrography, form the topics of articles in these issues of the *Record,* along with a table of the genera of bacteria and a biography of John Dancer.

* * *

We very much like and can heartily recommend the *Text-Book of Histology for Medical Students,* by Dr. Evelyn E. Hewer of the University of London. The subject has grown so detailed and elaborate in recent decades as to present a real problem in textbook construction, many of our best examples having become exceedingly lengthy in the endeavor to cover all chapters fully. Dr. Hewer has managed to condense the whole story within 365 pages, with a style that is terse, admirably organized, and yet complete and readable. The nervous system is especially well done. The 340 illustrations are splendid and include many large photomicrographs, some of which are the best we have seen. The C. V. Mosby Co., St. Louis, Mo. $4.50.

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Among Our Authors

Alexander Sprunt, Jr., (Years and Years) is an outstanding ornithologist; lives in South Carolina when he isn't checking up on the sanctuaries of the National Association of Audubon Societies, which organization he serves as supervisor of southern sanctuaries. Mr. Sprunt is also well-known as a writer of Nature stories.

Richard Finnie (Filming Musk-Oxen and Arctic Foxes) is a native of Dawson, Yukon Territory, and made his first Arctic exploration at seventeen, and thought he had enough when the old wooden ship of the expedition nearly foundered in a Labrador storm. However, the Arctic Circle has continued to lure him as explorer and photographer.

S. Judson Ewer (Singers of the High Places) is a botanist living near Bernardston, Massachusetts, at the edge of the Berkshire Hills. He is interested in plants both in the wild and in the garden, but is equally lured by all wild Nature as a scientist, writer and photographer.

I. H. Johnston (Black Snakes Do Rob Birds' Nests) is State Ornithologist of West Virginia and educational director of the State Conservation Commissioner. He is author of *Birds of West Virginia* and *Crooked-bill, The Story of a Quail*. Photographer and lecturer, his interests embrace all Nature.

Carsten Ahrens (A Dragonfly Cosmopolite) teaches English in the McKeesport, Pennsylvania, High School, and is specially interested in entomology. He has served as ranger naturalist with the National Park Service and is thus able to bring the Nature of the outdoors into the classroom.

Forest Fire Heroism

For valor in the face of a terrible enemy —forest fire, three medals have been awarded, one posthumously, to three men who fought the tragic Blackwater fire of August 21, 1937, in the Shoshone National Forest, Wyoming. Fifteen men lost their lives in that fire, one of them Paul E. Tyrrell of Oakland, California, to whose family one of the medals has been given. At a dinner held by the American Forestry Association in Washington, D. C., a medal was awarded to Urban J. Post of Buffalo, Wyoming, and award remains to be made to Bert Sullivan of Cody, Wyoming. The awards were made by the American Forest Fire Foundation, which is managed by a board made up of representatives of the American Forestry Association, the Society of American Foresters, the Association of State Foresters, the Charles Lathrop Pack Forestry Foundation and the National Lumber Manufacturers Association.

The World of Plant Life

This is the title of a splendid book that in size and importance should find a place on one's library shelves next to Hegner's *Parade of the Animal Kingdom*. The work of C. J. Hylander, assistant professor of Botany at Colgate University, this volume may well lay claim to being the most comprehensive book on plants yet written for the general reader. It ranges all the way from bacteria to orchids and is at once a reference book and a textbook of botany. Profusely illustrated with photographs and drawings and supplied with an excellent index and a check list, this book is a fine contribution to botanical literature. Published by Macmillan it is listed at $7.50, for it is a big book of more than seven hundred pages.

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Camera Trails

BY NORRIS W. HARKNESS

Summer with the Camera

Well begun is half done—especially in photography.

Some of us can do much to improve our work after the negative has been developed, but even the most proficient retoucher and process-user turns out better pictures if he has a good negative to begin with. By a good negative, we mean one that has been properly exposed and developed, and one that was made with some thought of the resulting picture in mind. There must be sufficient contrast both in the development and in the lighting used when the exposure was made, and the choice of the filter that will best bring out the vital objects is important. This seems complicated, but when we realize that much of our Nature photography can be done slowly and one step at a time, we are reassured. If we lay out a definite program to be followed in every type of picture making, except possibly the rare shot that must be snapped on the wing, we shall find our work improved. And such a program is not difficult.

In a rambling day in the woods we notice a bird's nest. It is of a species not yet personally photographed. And let us remind you that a nest must be identified to be worth photographing. Shall we take only the nest or its surroundings, or both? Perhaps we decide on a complete record that will involve one shot from the ground showing the height and location in the tree; a second from a closer viewpoint to show how the nest is attached to the branch; a third of its interior. Our decision will be affected by the accessibility of the nest and our chance of being able to find the necessary view-points.

Our next decision is that of the best place for the camera to show the tree and its surroundings. We shall need to be near enough to make the nest visible, and yet far enough away to include all the facts essential to our story. The nest and the branches of the tree are so nearly the same color that a filter will not help us, but beyond the tree are clouds, so we use the medium yellow or the light green filter to bring them out more strongly. The green will be a better choice as it will make the foliage a little lighter and thus in greater contrast to the brown nest. Our meter tells us the exposure that will give the best rendering of the scene as a whole, but we see that the nest is in shadow, so we increase the time a bit to bring out the detail better, and with the sunshade in place, we make the shot.

Then comes the climb to make the close-ups. Usually, the most effective shots to show the placing of the nest on the branch are made from below or above, so we find a vantage point and focus carefully. Now another choice awaits us. Do we want only the nest sharp, or do we prefer to stop the lens down and make everything as sharp and as detailed as possible? If we have enough light for a small lens aperture at an exposure time short enough to be made with the camera held in the hand, we shall probably prefer the latter, but often we are forced to increase the lens opening and use a higher shutter speed. Sitting on a small branch or clinging to the trunk of a moving tree is not conducive to steadiness in camera holding. The filter will not help us materially and lengthens the required exposure, so we do not use it and make the shot in accordance with the meter reading. We shall probably find it easier to pull the camera up after us with a cord than to climb with it, and it is almost sure to be safer for the camera.

The most difficult part of the job is making the exposure of the nest itself. We need a close viewpoint, which means stopping the lens down as far as we can to get the necessary depth of field, and this, in turn, calls for a comparatively long exposure. If the branch is too high and the nest too far out from the trunk, the shot is not worth the physical risk, and we shall be wise to forget it, but if we can pull it closer or bend the branch low enough to shoot it from the ground, we can tie it in place and make the exposure at leisure. We remember that a filter transmits best its own color and holds back the complementary color, and choose the filter accordingly. A shallow nest is easy to handle, but some of the deeper ones need extra light that we can supply best with a reflector. A white sheet of paper, or almost any light object, held so that the light shines into the darker places will illuminate them without losing the modeling and brilliance that the sunlight gives. If we can isolate the nest and its immediate support by throwing all else out of focus—which is easy when we are working at extremely short distances—and then reproduce every detail sharply, we should have an effective and satisfying picture. In some cases we can help to concentrate the interest of the shot by holding or hanging a gray or black cloth behind the nest far enough away to be out of focus. When we have gone to such lengths to get our picture, it will be wise on our part if we make two exposures—one as called for by the meter for the dark areas, and the other at least twice as long. The darkness of the inside of the nest and the need for all details require plenty of exposure.

More or less the same routine will be followed in taking flowers, and we must not forget the importance of the right background. Usually we include too much and seem to try to hide the principal object among leaves and grass. Here again the filter may help and the cloth can often be used to advantage, either as background or as a windshield when the flower is moving too much for the needed exposure. Too much emphasis cannot be put on the need for proper lighting. This is not easy to achieve, but careful choice of the best view-point and the use of a reflector will make our shot attractive. When the light is very poor, and the exposure long, we can sometimes highlight part of the flower with an ordinary flash-light, but this is feasible only when the exposure time is a minute or more. A photoflash bulb fired at some distance during the time exposure will often do the trick, but this demands experience for good results. Whatever the expedient that special conditions force us to adopt, the routine remains the same. We determine just what shall constitute our picture and exactly what else shall be included for atmosphere and background; we find the best view-point; we decide on the stop needed and the filter—if any—that we shall use and our meter or experience tells us the exposure; and our picture is made! With each step decided upon rather than guessed at, we are well on the way to real pictures that will combine scientific accuracy and detail with artistic merit. And we shall find such picture making more fun as well as more productive.

Improving the Finished Print

Often, when we have finished our print and it seems to be ready to be mounted and hung, we find on closer inspection that its dry condition shows that more might be done to improve it. The whole tone may be too dark, or the general effect might be better if the color were different, or some areas might be darkened or lightened. With care and without danger of spoilage, all these things may be done on the print that we have taken from the wash water and considered finished.

To lighten the entire print or some area of it, Farmer's reducer may be used. Since this is a most poisonous mixture, we must be careful to avoid spilling it and the print should be handled with tongs or rubber gloves. The process is simple—one-half ounce of potassium ferricyanide is dissolved in ten ounces of water, and two ounces of hypo crystals in ten ounces of water in another vessel. When we are ready to use the solution, the two are mixed together in a glass or porcelain tray, or an enameled one that has no cracks or chips, and the print, which has been soaked for a few minutes in clean water, is immersed as evenly as possible and left for one minute. Then it is washed quickly in plenty of water. If the reduction, for that is the name of this process, is not enough, the print goes back into the reducer for another minute and the washing is repeated. Do not leave the print in the bath too long, for the action is very fast when it begins and may result in too much removal of the image. There is no chemical way to replace what is gone. When the effect is right, wash the print as thoroughly as though it had just come from the hypo and dry it as usual.

The same solution may be used to brighten small areas. The parts should be surface-dried with a viscose sponge or a cloth and the reducer applied with a brush if the area is small, or with another sponge if large. Be sure to wash the chemicals off frequently or the reduction may be too great or yellow spots may result. If the tray has any exposed iron, or the brush has an iron or tin sleeve to hold the bristles, blue spots will appear on the print and they cannot be removed. This reduction adds to the contrast of the print and will often save one that was exposed too long when it was made.

If areas need to be darkened, we can help them with chalking, as it is called. There are two methods: one that involves roughening only the area to be worked upon with a little powdered pumice—sold in the drug store—and rubbing finely-ground chalk of the required color into the emulsion, and the other that mixes the chalk with the pumice and roughens and colors at the same time. The first permits more control, but either gives excellent results when we have used enough to become familiar with it. The colored chalks sold in the neighborhood art store work splendidly, and various colors may be mixed to match the tones exactly. Cotton on a match stick allows working on a small spot, and a swab of cotton lets us darken larger

areas. When we have the desired color, we can remove the excess chalk by blowing it vigorously and then clean it with a soft eraser from the places that did not need it. With the print altered to just what we want, we "set" the chalk to make it permanent. A tray somewhat larger than the print is filled with water and the print is held firmly by its ends and slid through the water as rapidly as possible. Held face down, one end is dipped under the surface of the water and the whole print is rushed through without stopping. If we allow the print to remain even for a second, the chalk will float off, and we have the whole job to do over again. After the swift bath, the print is hung up and allowed to dry without letting the water on the surface run back over it. Keeping the end that first came from the water at the top will prevent trouble, and when the print is dry, the chalk cannot be rubbed off.

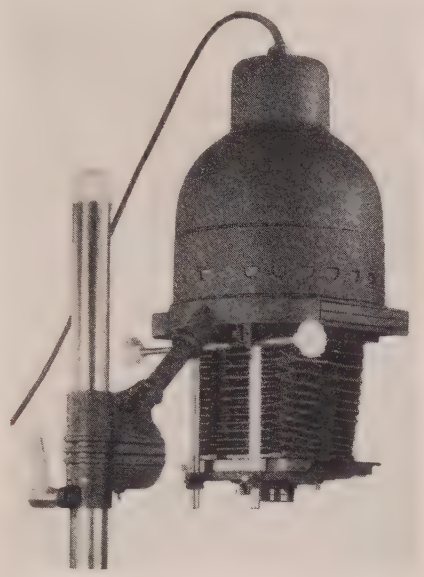
Chalking is harder to describe than to do, and a trial will show how very easy it is and how much we can help our prints with the process.

We can color our print very easily. There are many preparations on the market that allow us to make them nearly any color, and we can make parts of the picture different colors by following the maker's directions. Sepia is used most often and is recognized as a photographic standard. The necessary chemicals may be obtained in a glass tube that has two compartments. The contents are dissolved in accordance with the directions on the tube, and the print is submerged in one solution until the image nearly disappears. It is then thoroughly rinsed and placed in the second bath. There it turns brown. The final tone may be controlled by the amount of bleaching permitted in the first bath, a short stay in that bath resulting in a sepia tone overlying the black of the original picture. The original print should be a little heavy since the sepia toner usually reduces the picture to some extent.

For snow scenes, a bluish tone is desirable. A gold chloride toner is best for this color, which works best on the slower enlarging papers that have been fixed in plain hypo without any hardening agent. The ingredients may be purchased together in a kit and kept as stock solutions, or the various chemicals may be bought separately and mixed in accordance with one of the many published formulas. The print is simply left in the bath until it has gained the desired tone, and then washed. This toner intensifies the print a little, so the original print ought to be a trifle lighter than it needs to be for a black and white. Any good formulary will supply other toners that will enable us to give our print almost any desired color, but the two above are the most used and the most reliable. In working with any kind of toner, it is necessary to be sure that the trays are clean. The chemical reactions that are used to change the color of the silver in the print are easily affected by the presence of other agents, and dirty or chipped trays will often result in weird mixtures of colors, or in spots that are permanent.

Occasionally we may make use of the reducing or intensifying power of a toner to save an over- or under-exposed print, but this is a bad practice. We should tone a print only after we are convinced that giving it some color other than its original will make it more attractive and valuable. In the long run, we shall probably find that one print in twenty or more really gains from the change, and at least as many are injured by it. Discretion is the better part of valor.

Many of the questions that come to Camera Trails are of general interest, and it is our intention to begin, in one of the early fall issues, to answer this type of question in these columns if the idea appeals to you. We would greatly appreciate your comments on this suggestion and on anything else pertaining to what should appear here. Questions of less general interest will, of course, continue to be answered by mail, and we welcome every opportunity to make this department more valuable to you.



SOLAR SPECIAL 4 x 5 ENLARGER

The remarkable success enjoyed by the Solar Miniature Enlarger has prompted the manufacturers, Burke & James, Inc., of Chicago, to produce the Solar Special unit, which accommodates negatives up to 4 x 5 inches in size. While there is practically no end of miniature enlargers available on the market today, there are, by contrast, only a few enlargers for use by those amateurs who have always preferred to work with 3¼ x 4¼ to 4 x 5 inch negatives. The new Solar Special features a scientifically designed lamphouse with a diffused light source. The lamphouse is counter balanced to permit one hand operation in raising and lowering. Additional information may be secured by writing the manufacturer, Burke & James, Inc., 223 W. Madison St., Chicago, Illinois, direct.

The Raygram Corporation, 425 Fourth Avenue, New York City, distribute a wide line of photographic equipment and have just issued a new catalog which they will gladly send to us. Their most recent publication is "Successful Fine Grain Negative Processing," a sixteen-page booklet on development that will be helpful. If you wish this booklet, send five cents in stamps to the above company and mention Camera Trails.

Photo Marketing Corporation of 10 West 33rd Street, New York, have announced the latest addition to the Exakta line, the new 6 x 6 cm. Using the popular 120 film and retaining all the features of the V.P. and the Kine Exaktas, the 6 x 6 Exakta makes 12 exposures on the roll automatically spaced by one motion of a lever that at the same time

(Continued on page 301)

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CAMERA TRAILS

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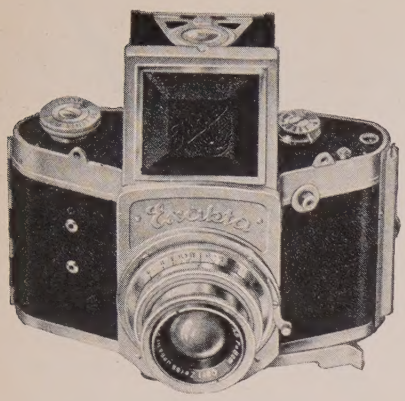

sets the mirror for the reflex focusing and winds the shutter for the next exposure. There is an internal switch for the synchronization of flash bulbs, and the bayonet-mounted lenses are instantly interchangeable. As shown in the accompanying cut the 6 x 6 Exakta is compact and beautifully finished. The above distributors have pamphlets describing the camera which they will mail to Nature readers on request. Please don't forget to mention Camera Trails.

Nature photographers interested in the history of their hobby will want the booklet recently published by Agfa Ansco Corp. of Binghamton, New York. The booklet not only briefly covers the story of the development of photographic materials and equipment, but describes the manufacture of the popular Agfa cameras and films and paper. Write to them for your copy.

One of the fastest selling of the lower priced cameras is the Univex Mercury. Its distributors who have made a varied line of movie cameras for many years, the Universal Camera Corporation of 30 West 23rd Street, New York City, have circulars describing the Mercury and the movie equipment.

As an addition to the recent discussion on flash bulb work for the Nature photographer, we have procured a supply of a valuable booklet entitled "Speed Flash Photography" issued by the Kalart Company. Your copy will be sent to you on request from this department. Please enclose a 3¢ stamp to cover the postage.

Camera Trails is edited for the readers of NATURE MAGAZINE who are interested in photography, and maintains a service that renders assistance with any photographic problem. You are most cordially invited to take advantage of this service. Address your communications to Norris W. Harkness, Camera Trails, Nature Magazine, 1214 Sixteenth Street, N. W., Washington, D. C.

Clubs Attention!

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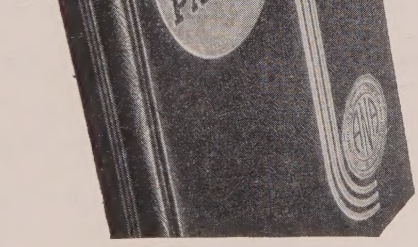

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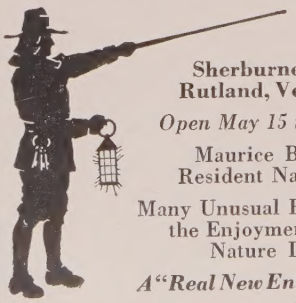

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Indoors and Out

By HOWARD ZAHNISER

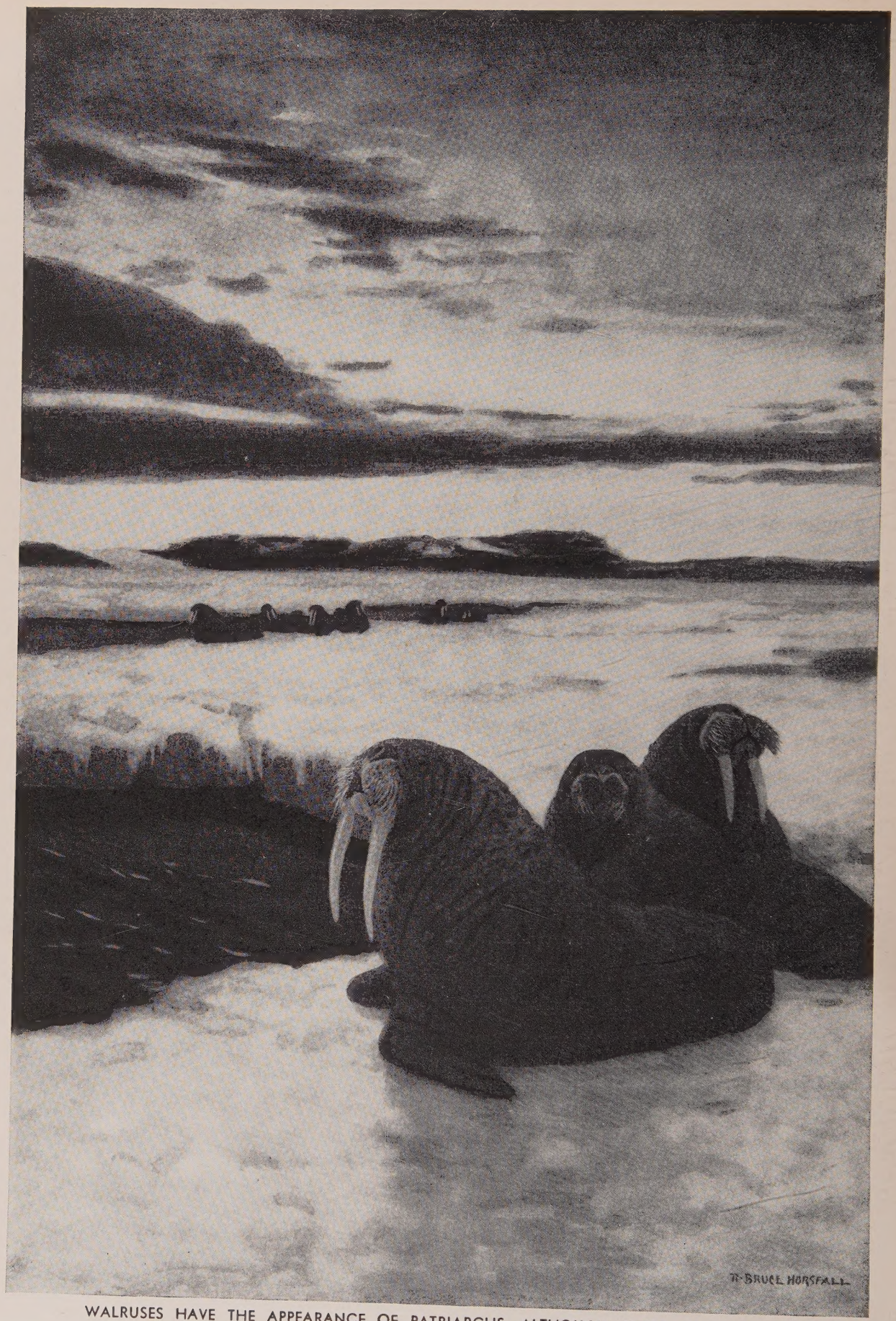
TASTY MORSELS of skunk cabbage are not among the usual June anticipations of seasonal foods, yet Oliver Perry Medsger has included this "potherb" in his *Edible Wild Plants* (The Macmillan Company, $3.50), and if the flavor of the skunk cabbage approaches in pleasure that of Professor Medsger's book it is surely worth trying. Professor Medsger himself says that he never "dreamed" of eating skunk cabbage until tempted by a friend. "My friend," he explains, "carefully collected the young leaves with their thick, almost white leafstalks and prepared them for cooking. In the boiling process, he changed the water two or three times. When he had cooked them tender, he seasoned with butter, pepper and salt. . . . All the offensiveness had disappeared, and the taste was pleasing."

Similarly I think that few prospective readers have anticipated the general interest and delight that are to be found in this fresh approach to plant life by Pennsylvania State College's professor emeritus of Nature Education. Following this new theme, Professor Medsger carefully describes and discusses with charming familiarity, personal anecdotes, and poetic quotations many more species than one would expect to find in such a work—sixty-nine fruits and berries, twenty-six salad plants and potherbs, nineteen roots and tubers, thirteen beverages and flavoring plants, and ten seeds and seed-pods, besides other species that are only listed. Nineteen photographs and eighty drawings are included, one of the photographs making it plain that the author really does mean the skunk cabbage that we all know, and a "seasonal, geographical, and descriptive key" indicates among other things that the skunk cabbage is "in season" from April to June.

Many readers will undoubtedly be satisfied with the indoor utility of Professor Medsger's volume, but those who are tempted to abandon their vegetable gardens and use it as a guide for the table will probably still wish to have a garden, if only for flowers. The garden urge seems either elemental or firmly established by tradition. One century of garden tradition has been exquisitely memorialized in June Rainsford Butler's *Floralia: Garden Paths and By-Paths of the Eighteenth Century* (The University of North Carolina Press, $5.00). Reading this book is as pleasant as gardening itself, and much easier. The chapter on "America: A Floral Hunting Ground" alone gives the work a high value on the shelf, and the four color plates are among the most excellent floral illustrations that I have seen. If a bit of perfume had been dropped on the plate of one of Redoute's roses I almost believe that I would have been tempted to try my fingers on the thorns.

It always seems easy to pass from the consideration of plants to insects, which observation may serve as a not-too-subtle introduction to William Morton Wheeler's posthumous volume of *Essays in Philosophical Biology* selected by Professor G. H. Parker (Harvard University Press, $3.00). In an article published in *Scientific Monthly* in May 1932, Professor Wheeler said that after studying ants for more than thirty years he wondered "why so very few of our Nature lovers have engaged in this pursuit". This article, which proceeded to motivate and guide the beginning myrmecologist, is one of the essays included in this representative and memorial volume. Another essay discusses "The Ant-Colony as an Organism", one deals with instincts, and another with animal societies. Two essays are biographical, Professor Wheeler writing of Fabre as an entomologist and of Carl Akeley as a close associate in youth, and to these should be added an introductory, biographical appreciation of Wheeler by four of his colleagues. The rest of the volume is largely concerned with philosophical considerations regarding research, academic biology, theory, and society. Despite the occurrence of many terms rather unfamiliar to the general reader, the volume is easy to read. "Philosophical" in the title is a fair warning, but it need not frighten. Thomas Barbour in a foreword says that "Wheeler wrote most of these essays in a spirit of fun", and although they are most surely serious they are never solemn, but witty and good-natured. A few years ago I found Professor Wheeler's volume on ant-lions and worm-lions, *Demons of the Dust,* to be among the most fascinating of works on insects. This present volume is all the more welcome to those who have known such previous works, and for others one would hope that this will be an introduction. Certainly the collection exemplifies the breadth of Wheeler's culture and his scientific and social interests. The depth of his thinking is likewise apparent, and for those who will give the book a depth of concentration there is certain to be a deep interest and many chuckles. One quotation is inescapable, from "The Dry-Rot of Our Academic Biology": "It quite saddens me to think that when I cross the Styx I may find myself among so many professional biologists, condemned to keep on trying to solve problems . . . while the amateur entomologists . . . are permitted to roam at will among the fragrant asphodels of the Elysian meadows, netting gorgeous, ghostly butterflies until the end of time."

Plants, flowers, insects—all are engaging, but it seems certain that the birds are firmly established as first in interest for the majority of outdoor folks. The activities of publishers reflect this interest, and there are at least three recent books on birds that will undoubtedly contribute to the June-July enjoyments of any who are fortunate to possess them. Roger Tory Peterson's *A Field Guide to the Birds* in a revised and enlarged edition (Houghton Mifflin Company, $2.75) is one of these, the best of all our field guides even in its earlier edition, and now improved. Peterson's use of pattern and outline for identification, rather than the bright colors seldom seen in the field, seems to be his greatest original contribution. Most of the illustrations are in black and white, though the warblers and some other species are shown in color. The book is the right size and well made. (Continued on page 351)



WALRUSES HAVE THE APPEARANCE OF PATRIARCHS, ALTHOUGH THERE EXISTS LITTLE EVIDENCE BY WHICH TO ESTIMATE THE LIFE-SPAN OF THESE HUGE BEASTS OF THE NORTHERN ICE-PACKS. IT IS PROBABLE THAT MANY OF THEM LIVE LONGER THAN DO THE ESKIMOS WHO HUNT THEM